

STATE OF NEW MEXICO
ENERGY, MINERAL AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

ORIGINAL

APPLICATION OF THE NEW MEXICO OIL AND GAS
ASSOCIATION FOR AMENDMENT OF CERTAIN PROVISIONS OF
TITLE 19, CHAPTER 15 OF THE NEW MEXICO
ADMINISTRATIVE CODE CONCERNING PITS, CLOSED-LOOP
SYSTEMS, BELOW GRADE TANKS AND SUMPS AND OTHER
ALTERNATIVE METHODS RELATED TO THE FORE GOING
MATTERS, STATE-WIDE.

CASE NO. 14784 AND 14785

VOLUME 19

January 9, 2013
9:00 a.m.
Wendell Chino Building
1220 South St. Francis Drive
Porter Hall, Room 102
Santa Fe, New Mexico

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JAMI BAILEY, Chairperson

GREG BLOOM, Commissioner

DR. ROBERT BALCH, Commissioner

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1 (Note: In session at 9:00.)

2 CHAIRPERSON BAILEY: Good morning. this is
3 a meeting of the Oil Conservation Commission at 9:00
4 o'clock in the morning of Wednesday, January 9th,
5 2013. To my right is Mr. Greg Bloom, who is
6 designee of the Commissioner of the Public Lands.
7 To my left is Dr. Robert Balch, who is the designee
8 of the Secretary of Energy, Minerals and Natural
9 Resources. I am Jami Bailey, Director of the Oil
10 Conservation Division. All three members of the
11 Commission are here so we do have a quorum.

12 Commissioner Balch, have you had a chance
13 to look at the Minutes of the December 20 and 21
14 meeting of the Oil Conservation Commission?

15 DR. BALCH: I have.

16 CHAIRPERSON BAILEY: Terry Warnell was the
17 designee of the Commissioner of Public Lands so he
18 was not here to comment on the Minutes. Do I hear a
19 motion to adopt the Minutes of December 20 and 21st?

20 DR. BALCH: I will make the motion to
21 adopt those Minutes.

22 CHAIRPERSON BAILEY: And I second. All in
23 favor? Aye. And I will sign on behalf of the
24 Commission and give them to our commission
25 secretary.

1 Today we call Case No. 14784 and 14785,
2 which are the applications of the New Mexico Oil and
3 Gas Association and the Independent Petroleum
4 Association of New Mexico for amendment of certain
5 provisions of Title 19, Chapter 15 of the New Mexico
6 Administrative Code concerning pits, closed-loop
7 systems, below-grade tanks, sumps and other
8 alternative methods related to the foregoing and
9 amending other rules to conform changes state-wide.
10 I ask for appearances.

11 MR. FELDEWERT: Madam Chair, Michael
12 Feldewert, Santa Fe office of the law firm of
13 Holland & Hart appearing on behalf of the New Mexico
14 Oil and Gas Association.

15 MS. FOSTER: Good morning, members of the
16 Commission. I'm Karin Foster on behalf of the
17 Independent Petroleum Association.

18 MR. JANTZ: Madam Chair, members of the
19 Commission, Eric Jantz, New Mexico Environmental Law
20 Center on behalf of the Oil and Gas Accountability
21 Project.

22 DR. NEEPER: Good morning. I'm Donald
23 Neeper appearing on behalf of New Mexico Citizens
24 for Clean Air and Water.

25 MS. GERHOLT: Madam Chair, Commissioners,

1 I'm Gabrielle Gerholt on behalf of the Oil
2 Conservation Division.

3 MR. FORT: Patrick Fort on behalf of
4 Jalapeno Corporation.

5 MR. BRUCE: Madam Chair, Jim Bruce
6 representing Nearburg Producing Company.

7 MR. DANGLER: Hugh Dangler on behalf of
8 the State Land Office.

9 DR. BARTLIT: John Bartlit on behalf of
10 the New Mexico Citizens for Clean Air and Water. I
11 believe an appearance was submitted on my behalf.

12 CHAIRPERSON BAILEY: On November 15th,
13 2012 the Commission entered an oral order requiring
14 the applicants to submit a revised set of tables
15 using a consistent method of reporting measurements
16 for each value provided in the tables, a final
17 version of the rule-making proposal that correctly
18 indicates which language in the current rule is
19 proposed to be repealed or amended, and reopened the
20 record for the limited purpose of receiving
21 testimony on the revised set of tables submitted by
22 the petitioners.

23 There have been motions connected with
24 that oral order. One is the Petitioner's Motion to
25 Exclude Witnesses Identified in OGAP's Notice of

1 Intent to Present Testimony, and a response to
2 Petitioner's Motion to Include Witnesses. We also
3 have a third Motion to Exclude Portion of Exhibit 6
4 and Related Testimony Identified in NMCCA and W's
5 prehearing statement for the January 9th hearing.

6 We will first take up the matter of the
7 Motion to Exclude Witnesses identified in OGAP's
8 Notice of Intent to Present Testimony. I would like
9 to hear some arguments and we will ask for guidance
10 from the commission counsel following those
11 arguments.

12 MR. FELDEWERT: Madam Chair, Michael
13 Feldewert for the New Mexico Oil and Gas
14 Association. We filed both motions, and with your
15 permission, since the arguments are essentially the
16 same, I will go ahead and address both motions at
17 this point if that's okay.

18 CHAIRPERSON BAILEY: We will not rule on
19 the second one until we have ruled on the first one.

20 MR. FELDEWERT: Okay. Under the Order
21 that was issued at your hearing on November 15th and
22 again subsequently as noted in the subsequent public
23 notice, this hearing today is limited today, as you
24 expressed, to the revisions to the tables that have
25 been filed by Petitioners, nothing more.

1 Any modifications to those revisions filed
2 by the Petitioners had to be filed by December 24th.
3 No modifications were filed so there are none to
4 consider. The only topic for testimony and hearing
5 today are the limited revisions to tables filed by
6 the petitioners, and the testimonies that has been
7 identified by OGAP do not address the revisions
8 filed by the petitioners or the reasons for the
9 revisions to the tables that were filed by the
10 Petitioners.

11 And I think it's important to go back and
12 look at the reasons for the revisions, because it is
13 clear from the transcript from the November 15th
14 hearing. If you look at the transcript at Page 4,
15 this body was concerned with chlorides only at that
16 time, and your concern was limited to the fact that
17 the proposed tables used milligrams per kilogram for
18 chlorides in Table 1 and milligrams per liter for
19 chlorides in Table 2, and a question arose with this
20 body as to whether there should be the same standard
21 for chlorides in both tables; for example, whether
22 Table 2 should be milligrams per kilograms rather
23 than milligrams per liter.

24 So to address that narrow issue this body
25 did two things. It voted to require Petitioners to

1 submit a revised set of tables, and at your
2 transcript on Page 6, Line 6, instructions were,
3 "Submit a revised set of tables providing a
4 consistent method of reporting measurements for each
5 value provided in the tables." You then voted to
6 hold a public hearing for the following limited
7 purpose. And again, this is borne out in the
8 transcript at Page 6, Line 13 and I quote: "For the
9 limited purpose of receiving testimony on the
10 revised set of tables submitted by the Petitioners."
11 You also asked at that time that the Petitioners
12 include in their filing corrections to the pages of
13 strikeouts in NMOGA's Exhibit 1 because some of
14 those pages of strikeouts was missing some limited
15 text from the 2009 amendments. And the Commission
16 observed that was a minor issue but since we were
17 going to file those corrections you wanted those
18 included in the submission.

19 So as a result pursuant to that order,
20 NMOGA filed what they entitled Notice of Corrections
21 to the Proposed Amendments and they substituted
22 NMOGA Exhibit 20 for NMOGA Exhibit 1, and as a side
23 note, NMOGA Exhibit 20 has the same pagination as
24 NMOGA Exhibit 1. So if we have a reference in the
25 transcript to certain pages of those exhibits, it

1 applies equally to the substituted Exhibit 20.

2 That substituted Exhibit 20 accomplishes
3 three things: It inserts the limited text that was
4 missing from the 2009 amendments in the pages of
5 strikeouts in NMOGA's proposal as you instructed.
6 Number two, it incorporates the modifications to
7 NMOGA's proposals that were filed in April and May
8 before any of the hearings commenced. So now the
9 modifications are all in that single document. And
10 finally, and it's important for the hearing here
11 today, it made limited corrections to the Method
12 column for chlorides only in the proposed tables.

13 If you have in front of you NMOGA's
14 Exhibit 20 which was part of our Notice of
15 Corrections, that's Exhibit 20 and on Page 41, same
16 pagination, are the tables. We made four changes:
17 First, for chlorides in the Methods column, we
18 substituted Method EPA Method 300.0 for EPA Method
19 300.1. Number two, we moved that asterisk
20 underneath the tables from the entire Method column
21 to the chlorides only because that's really where it
22 fit. Number three, we changed that asterisk to read
23 as it does now, "Or other test methods approved by
24 the division." And finally, number four, we moved
25 the reference to EPA SPLP and SW-846 that was

1 formally in the asterisk, we moved that directly
2 from the asterisk to the Method column for chlorides
3 in Table 2 because that's where it belongs. Nothing
4 else was changed.

5 We are going to call Dr. Clay Robinson
6 here today, and he is going to discuss why these
7 limited changes to the testing methods for chlorides
8 in the tables are more accurate and scientifically
9 sound. He is going to discuss why chlorides must be
10 measured in milligrams per kilogram in Table 1 and
11 milligrams per liter for Table 2 and then he is here
12 to answer whatever questions you have or anyone else
13 has about the changes.

14 That is the subject of this hearing per
15 your directive in November and per the public
16 notice. OGAP wants to strip away any sideboards
17 from the hearing. They want to call two witnesses
18 to testify for eight hours on what they term the
19 impact to the environment from, I quote, the
20 proposed waste concentrations in NMOGA and IPANM's
21 petitions. They want to discuss this limits column
22 as filed in our petitions over a year ago. These
23 limits were provided in September of 2011. They
24 have not disclosed any witness whatsoever to address
25 the subject of this hearing, the revisions to the

1 tables filed by the Petitioners, and they have done
2 some selective quoting, I would submit, in their
3 response to you to suggest that there are no
4 sideboards in the hearing and essentially they can
5 have a do-over and they can call two more witnesses
6 to address exactly what their rebuttal witness,
7 Ms. Martin, discussed with you back in August.

8 Now, there's no basis for OGAP to now do a
9 do-over with respect to the conservations that were
10 proposed in September of 2011. This hearing is not
11 noticed to address those issues and these witnesses
12 that they have provided go well beyond the limited
13 purpose you have expressed for the hearing today.
14 So the topic they want to address has been the
15 subject of your deliberations and considerations by
16 the parties since these proposals were first
17 submitted in September of 2011. It was the subject
18 of extensive hearings from May through August before
19 this body, and what they want to discuss has nothing
20 to do with the revisions we have proposed.

21 So unless you are now removing the
22 sideboards that you carefully placed on this hearing
23 in November and unless we are now going to have a
24 do-over for everybody to submit evidence on the
25 proposals first placed before you in September of

1 2011, you must preclude their witnesses.

2 CHAIRPERSON BAILEY: Mr. Jantz? Do you
3 have a response?

4 MR. JANTZ: Yes, Madam Chair, members of
5 the Commission. In addition to the written response
6 that we provided, I want to make two very brief
7 points to the Commission. First, I think we need to
8 remember why we are here today and the reason why we
9 are here today is to cure the notice problems that
10 came with the fact that NMOGA and IPANM filed
11 petitions based on an incorrect superseded rule.
12 They used the wrong rule as the basis for their
13 petitions.

14 If you look back at the transcripts from
15 the Commission's deliberation when the mistake was
16 discovered, Volume 18, Pages 3806 through 3808, the
17 discussion among the commissioners clearly shows
18 that the concerns were with the problems of what was
19 omitted from the tables, the 3103 standards as well
20 as the limits. And that goes to the second point,
21 that the Commission on Page 4 of the November 15th
22 transcript, Line 12, 11 through 16, specifically
23 says that there are concerns with the numerical
24 limits.

25 So based on that fact, I think it's fairly

1 clear what the Commission intended here is to have a
2 thorough discussion of what these tables really
3 mean.

4 The second point I want to make, the
5 second big-picture point, is that this is a
6 rule-making and essentially what the petitioners are
7 asking the Commission to do are make evidentiary
8 judgments in limine, which is an judicatory process.
9 That's not appropriate for this rule-making. The
10 only guidepost this Commission has for dealing with
11 evidence in a rule-making is relevancy. If evidence
12 is relevant, it's got to be admitted and it's got to
13 be considered according to the procedural rules
14 that -- Commissions on Procedural Rules. So with
15 that, I believe that there's ample authority and
16 basis to allow OGAP's witnesses to testify in the
17 supplemental hearing. Thank you.

18 CHAIRPERSON BAILEY: Mr. Smith, do you
19 have guidance for the Commission?

20 MR. SMITH: Do you want to allow a reply?

21 CHAIRPERSON BAILEY: Sure.

22 MR. FELDEWERT: Very brief. With respect
23 to the selective quotation of numerical limits, as
24 they did in their response, the concern was the fact
25 that milligrams per kilogram was used for chlorides

1 in one table and milligrams per liter in the other.

2 That was the concern with the numerical limits.

3 Secondly, with respect to the missing text
4 in NMOGA's initial proposal, the Commission
5 carefully looked at that both during your
6 deliberations and at the November 15th hearing.
7 What you said at the November 15th hearing which
8 they do not quote is that the Commission finds that
9 such inconsistency and mistakes in transcription of
10 a language from the current rule. "Because this has
11 occurred only in areas where the current rule
12 language is proposed to be repealed or amended, we
13 do not find any concerns with the current
14 rule-making process, including notice provided to
15 the public." So that is not by any stretch of the
16 imagination a reason we are here today.

17 The relevant issue here today is the
18 changes that were made to the tables by the
19 petitioners. That is the topic to which relevancy
20 is gauged. And the witnesses that they have
21 disclosed do not purport to offer anything on this
22 relevant topic.

23 CHAIRPERSON BAILEY: Now do you have
24 guidance for us?

25 MR. SMITH: Sure. With respect to some of

1 the broad comments that were made at this point,
2 particularly by Mr. Jantz, it is true, I think, that
3 we were all somewhat taken aback, not just the
4 Commission but everyone here, when you discovered
5 the problem with industry and NMOGA and IPANM having
6 attached an old version of the rule that was
7 black-lined in their petition. I think in the
8 interim, however, and I think that you made this
9 clear at your November 15 meeting, that in the
10 interim you had looked at that and it was not the
11 problem that I think everyone at one point thought
12 that it might be.

13 With respect to the notion of the only
14 standard being relevance in a rule-making, I do
15 believe that you can give order to your rule-making
16 as you have and move through and not allow ground to
17 be recovered, and particularly when you reopen a
18 hearing I think you can reopen it for a limited
19 purpose. Having said that, in response to Mr.
20 Feldewert's argument morning, you can reopen the
21 hearing and hear anything you want to hear.

22 It seems to me that the real question here
23 is the notice, and what we have in the motion is the
24 idea that a notice was clearly limited to a
25 particular area, and I believe that Mr. Jantz argues

1 that that notice was ambiguous and he reads it to be
2 broad enough to encompass what he wants to put on
3 today.

4 So I think the real issue that you have is
5 what a reasonable person would think could be put on
6 today based on the notice that you put out, and
7 because the notice references your oral ruling at
8 the hearing, I think that you can look at the
9 transcript as well.

10 So your notice says that the Commission
11 entered an oral order requiring the applicants in
12 the above cases to submit a revised set of tables
13 related to applicants' proposed closure and
14 reclamation requirements. And it goes on to say
15 that you orally ordered that the testimony be taken
16 on the revised tables and it specifically references
17 the meeting of November 15, 2012.

18 So I think, first of all, you look at the
19 notice and it says that evidence will be taken on
20 the revised tables. Then you look at your
21 transcript from November 15 which both sides have
22 cited, and it seems to me that the important
23 features -- and I'm not going to give page citings
24 or lines. I think everybody has the transcript.
25 The first thing you say about the tables is,

1 "Second, there was a concern about the contaminant
2 levels in the tables." You go on to say, "The issue
3 with the tables is more serious, and I don't see a
4 way to solve that problem without reopening the
5 record and allowing additional testimony on that
6 point. There is not sufficient testimony in the
7 record about the measurement levels to allow us to
8 correct the problems without getting more input from
9 the parties. These tables use values that are
10 reported as either milligrams per kilogram or
11 milligrams per liter. The tables should use one
12 method of reporting for all values, particularly
13 since the Commission is leaning towards the use of
14 only one table rather than two." Then you go on to
15 recommend that milligrams per kilogram would be the
16 more appropriate method of calculation.

17 However, since the record does not support
18 any conversion of values currently in the proposal,
19 the Commission cannot make such a conversion on its
20 own. The Commission must require that an amended
21 set of tables be submitted and the testimony must be
22 taken on the amended tables before the Commission
23 can complete deliberation on the rule-making
24 proposal. Then you go on to enter your order.

25 Now, the question then, I think, before

1 you all is given the notice and given the transcript
2 of the hearing that is referenced in the notice,
3 what would a reasonable person believe was the
4 subject of this hearing, and I think I have read to
5 you the most relevant portions. So I think that's
6 the issue before you and that is something that I
7 think would not be appropriate for me to decide, but
8 you all need to decide.

9 I would say that whatever you decide in
10 that regard, I don't think it is necessary to
11 exclude witnesses. I think it is necessary for you
12 to frame what the hearing is about and then move
13 forward.

14 CHAIRPERSON BAILEY: Thank you for your
15 guidance. Commissioner Balch, do you have an
16 opinion on the motions before us?

17 DR. BALCH: I believe at least in my mind
18 on November 15th that the intent was to try to
19 understand why there were two different measurements
20 used and that was the primary concern.

21 CHAIRPERSON BAILEY: Commissioner Bloom?

22 MR. SMITH: Let me interrupt here. Your
23 intent, I think, is relevant but I think what you
24 need to address is what you think people would get
25 from reading the transcript and from looking at the

1 notice.

2 DR. BALCH: From reading the transcript
3 and listening to Mr. Smith talk about it, I thought
4 it was fairly clear that we were discussing why
5 there were milligrams per kilogram and milligrams
6 per liter. I don't think that I would interpret it
7 to mean that we were concerned with the limits
8 themselves, which were discussed in direct and
9 cross-examination here. Now, I also, as you know,
10 think more data is always good. However, I think
11 that when I prepared to come up here today I thought
12 the case was going to be about the tables and the
13 units in the table, not the limits in the table.

14 CHAIRPERSON BAILEY: Commissioner Bloom,
15 do you have an opinion?

16 COMMISSIONER BLOOM: Yes. Madam Chair,
17 given the written order that went out and then, of
18 course, your oral order on November 15th, it seems
19 clear to me what we were looking for was to see one
20 standard of units used here, and you mentioned
21 specifically going to milligrams per kilograms. I
22 think that seems quite clear. The existing standard
23 is in milligrams per kilograms and we are going to
24 be going to milligrams per liter so I am very
25 interested in hearing the proponents' reasoning for

1 making this transition to milligrams per liter.

2 I think when we see a transition to
3 milligrams per kilogram, if there's a large increase
4 in the chlorides I would be interested in hearing
5 testimony about what the impacts of that would be.
6 I do not feel that we need to go into EPA and BTEX
7 Benzene again. I don't believe we were looking to
8 run through that again. We heard quite a bit of
9 testimony on that, a lot of conversation about it.
10 So just to finalize, I think, the conversation is
11 about chlorides and the standard that we are going
12 to use, milligrams per kilogram or milligrams per
13 liter moving forward.

14 CHAIRPERSON BAILEY: I also agree that we
15 need to limit testimony in this case to the units of
16 measurements that are being used; that that does not
17 necessarily exclude witnesses if witnesses would
18 like to address those issues, if they are qualified
19 to do so. The question had to do with the units of
20 measurement, not with the values of those analyses.

21 MR. SMITH: Madam Chair, let me ask again,
22 you need to consider based on the transcript that
23 was referenced, do you believe that that limitation
24 was clear?

25 CHAIRPERSON BAILEY: I think a reasonable

1 person would be able to interpret the notice and the
2 order that was given in the transcript as being
3 confined to those areas dealing with the units of
4 measurement.

5 DR. BALCH: I think the key word is
6 limited. Once you see the word limited, you
7 interpret that to mean there are boundaries.

8 MR. SMITH: That's fine. I just want to
9 make sure you all consider what I think you should.

10 COMMISSIONER BLOOM: Mr. Smith, I focus in
11 on Page 4, which we looked at already today, but at
12 Lines 18, 19 and 20. "The table should use one
13 method of reporting for all values, particularly
14 since the Commission is leaning towards use of only
15 one table rather than two."

16 CHAIRPERSON BAILEY: Then we are in
17 agreement that we will go forward with testimony
18 limited to those specific areas without the
19 exclusion of witnesses if they are qualified to
20 conduct said testimony on that purpose. Then I need
21 to announce that we are back into session and the
22 rule-making --

23 DR. BALCH: I have a motion.

24 CHAIRPERSON BAILEY: Go ahead.

25 DR. BALCH: No, the other motion --

1 CHAIRPERSON BAILEY: I think the decision
2 for this first series of motions will also apply to
3 the other motion that was connected with
4 Dr. Neeper's -- NMOGA's Motion to Exclude Portions
5 of Exhibit 6 and Related Testimony identified in
6 NCCA&W's statement for January 9th so those portions
7 of New Mexico Citizens for Clean Air and Water
8 testimony will also be limited to those areas that
9 we have allowed for OGAP.

10 DR. NEEPER: Excuse me, Madam Chairman. I
11 hear that the motion is sustained but I have not
12 been allowed to address the motion; is that correct?

13 MR. SMITH: I believe that's fair.

14 CHAIRPERSON BAILEY: That's fair, yes. I
15 would like to hear you.

16 DR. NEEPER: Because I received the motion
17 only last night, I have not had time to prepare an
18 in-depth response. However, I do have a response.
19 At some risk of repeating some things Mr. Smith
20 said, I will give you my response at length because
21 it pulls together as a single argument.

22 The Commission ordered testimony be taken
23 on the revised tables. The Commission did not order
24 that testimony be taken on selected elements of
25 those revised tables. The declaration that

1 discussion must be restricted only to those items in
2 the table that have been changed is a defense
3 designed to thwart the need and the intent of the
4 Commission.

5 As Chairman Bailey said on November 15th,
6 "There is a concern about the contaminant levels in
7 those tables." Transcript Page 3, Lines 18 and 19.
8 "The issue with the tables is more serious, and I
9 don't see a way to solve that problem without
10 reopening the record and allowing additional
11 testimony on that point. There is not sufficient
12 testimony in the record about the measurement levels
13 to allow us to correct the problems without getting
14 more input from the parties."

15 This could lead one to believe that you
16 intended to discuss the levels. "The Commission
17 should have concerns about the numerical limits." I
18 accent that. Numerical limits in the tables that
19 are part of Section 19-15-17.13. "These tables use
20 the values that are reported as either milligrams
21 per kilogram or milligrams per liter. The table
22 should use one method of reporting for all values,
23 particularly since the Commission is leaning towards
24 use of only one table rather than two." One
25 changing two tables into one, implies to the reader

1 that there could be very significant changes, and
2 the Commission needs all the tools it can get to
3 make those changes. "I recommend that since
4 measurements are of soils or waste mixed with soils
5 that milligrams per kilogram would be a more
6 appropriate Method of calculation. However, since
7 the record does not support any conversion of values
8 currently in the proposal, the Commission cannot
9 make such a conversion on its own."

10 This indicates that the Commission is
11 considering converting values and it should have
12 whatever tools it needs in terms of conversion.
13 These quotes are from the transcript, Page 4, Line 8
14 to Page 5, Line 1.

15 The Commission specifically requested a
16 change of units and the Commission stated that its
17 deliberations were constrained because the record
18 contained no method for conversion between various
19 systems of units. I accent the word method there.
20 The applicants did not offer either a revised set of
21 units or a conversion method. It appears that the
22 applicants did not comply with the Commission's
23 request because to comply would change a numerical
24 entry in the table and thereby invite discussion.

25 This motion then that I am addressing is

1 an attempt to constrain the Commission's action
2 despite the Commission's own request. If the
3 applicants refused to honor the Commission's
4 request, that is their privilege. However, other
5 parties should be allowed to address the
6 Commission's concern, and to do so necessarily
7 requires discussing elements in the table that the
8 applicants refused to change.

9 There is a consistent history behind the
10 refusal to alter or to discuss the units in Table 2.
11 I recognized this difficulty of units during the
12 Industry's direct testimony and I tried to get
13 Industry's witnesses to address this difficulty. In
14 cross-examination I asked Mr. Gantner for the
15 context of the numbers. I asked whether routine
16 operations would exceed the limits given in Table 2.
17 He deferred to Mr. Fanning's future testimony and
18 did not discuss the topic.

19 I asked Mr. Arthur for the equivalents
20 between milligrams per liter and milligrams per
21 kilogram in the pit content. He said he would have
22 to do math and he didn't want to do that on the
23 stand. That's the transcript, Page 701 to 702 and
24 the comment to Mr. Fanning is in the transcript at
25 Page 127.

1 I asked Dr. Buchanan specifically if he
2 would compare the results of experimental studies
3 which he cited in EC units with the units that
4 appeared in the rule. He answered that the question
5 had been asked earlier and then said, and I quote,
6 "The answer is no." That's Transcript Page 81,
7 Lines 15 through 20.

8 Industry's witnesses have had multiple
9 opportunities to clarify the various units appearing
10 in the testimony and in the rule, and there are more
11 units in testimony than strictly milligrams per
12 kilogram or milligrams per liter. A significant
13 amount of the testimony deals with the EC units.

14 Now under a specific request from the
15 Commission, the Industry again has not revised the
16 units and thereby it attempts to prohibit others
17 from doing so under the excuse that to do so would
18 be an improper procedure. In the conduct of
19 hearings, Subsection 19.15.3.12A1 of the rule book
20 says the rules of civil procedure and the rules of
21 evidence shall not apply. Thus, we are not
22 concerned with whether the evidence must be excluded
23 by terms of the rule.

24 Furthermore, Subsection 19.15.3.12B2 says
25 the Commission shall, and I accent the term shall,

1 admit relevant evidence unless the evidence is
2 incompetent or unduly repetitious. My competence
3 has already been established before the Commission,
4 and I point out that it is impossible to be
5 repetitious on a topic for which discussion has been
6 repeatedly and deliberately avoided.

7 Discussion of the units of the rule in the
8 context of the units that appear in the various
9 testimonies and discussion of the origin of the
10 proposed limits in the context of actual operations
11 are elements of evidence very related to the
12 specific requests of the Commission. A contaminant
13 limit has a unit and a context within which it must
14 be understood. Without the context, the limit is
15 simply black marks on white paper. Discussion of
16 the units and the limits of the tables cannot
17 reasonably be excluded from the hearing that was
18 called by the Commission itself for the purpose of
19 revising the tables..

20 The Commission has itself discussed
21 revising the two tables into one. Revising the two
22 into one might alter any entry or all entries of the
23 proposed two tables, so it is clear that the
24 Commission, by this member of the public, at least,
25 did not intend to restrict consideration only to

1 those particular entries that the Industry elected
2 to change.

3 At its own choice, the Industry has
4 repeatedly refused to discuss the content and the
5 context of the tables. The Industry should not be
6 allowed to prevent other parties from discussing
7 those things that it refuses to discuss itself. In
8 as much as NMOGA's Motion to Exclude Portions of our
9 Exhibit 6 and the testimony related to that was
10 served to us only yesterday and was received by
11 myself last night less than 12 hours ago, I have not
12 had sufficient time to prepare a detailed rebuttal.
13 However, I noted some errors on the first page of
14 that motion and that is the only page I have had
15 time to read. Those errors will be clarified if my
16 testimony is on allowed.

17 First, we do not propose to provide
18 further testimony on the chloride threshold for
19 grasses. We are using data of other authorities,
20 data already in evidence in this hearing, to
21 indicate how EC units may be converted to milligrams
22 per kilogram units. We are not arguing the
23 thresholds, we are comparing two datasets, both of
24 which came from other established authorities to
25 show the conversion between EC and milligram units.

1 I could have made a different chart to do
2 this. Instead, I chose to use a chart that was
3 already in evidence at the hearing. Had I used a
4 different chart, it could have been labeled with
5 arbitrary names. The word grasses would never have
6 appeared in it, but surely someone would have asked
7 for the details of where the data came from and we
8 would be right back at the beginning, and so I took
9 the simple way out which was to use a chart that was
10 already in the record of the hearing.

11 Secondly, among these errors NMOGA asserts
12 that we are revising Exhibit 5. To make our
13 presentation understandable we copied a page from
14 Exhibit 5 into Exhibit 6. It is clearly labeled as
15 a page of Exhibit 6, but we have noted on it its
16 origin in Exhibit 5. This changes nothing in
17 Exhibit 5. We could have prepared, as I said, an
18 entirely new chart but we took the simple way out
19 hoping to be more understandable and transparent.

20 A third point. NMOGA states that our
21 exhibits regarding setbacks are not within the
22 purpose of this hearing. That might seem apparently
23 true. However, we are not arguing the location or
24 the extent of those setbacks. We are showing
25 apparent errors in the wording of the proposed text

1 of the rule that conflicts with or confounds the
2 application of the limits in the tables, whatever
3 those limits might be. We would be irresponsible if
4 we did not bring such administrative confusion to
5 the attention of the Commission.

6 In summary, my testimony was crafted to
7 avoid the issues raised in the first page of this
8 motion. I haven't had time to read the successive
9 pages, but I suggest the Commission should hear the
10 testimony, and then if objections are raised the
11 Commission can elect to delete selected sections
12 from the record if it wishes.

13 If the Commission chooses instead to
14 restrict that testimony, then I would suggest it
15 would be better to continue this hearing into next
16 week to allow me time to respond adequately to
17 portions of this motion which I have not had time to
18 read. Thank you for your attention.

19 CHAIRPERSON BAILEY: Do you have a
20 response, Mr. Feldewert?

21 MR. FELDEWERT: We filed a motion
22 yesterday morning with the Commission and served it
23 yesterday morning, so I don't know why Dr. Neeper
24 didn't get it until last night but it was served
25 yesterday morning after reviewing what they had

1 submitted with their prehearing statement.

2 As you know, I have gone through and
3 identified what we modified to address your issue
4 and we will discuss why. For example, Commissioner
5 Bloom, we are not changing the unit of measurement.
6 Those remain the same. They are constant. The only
7 things that have changed is the method of testing to
8 more match the units of measurement that have
9 already been proposed, so we will discuss why that's
10 the case and we are going to discuss why you have to
11 have milligrams per kilogram for Table 1 and
12 milligrams per liter in Table 2. So that's the
13 topic.

14 I could only glean what they want to
15 present from their presentation, from their exhibits
16 that they filed, and they had two conclusions at the
17 end that when you read them are beyond the scope of
18 what you have identified for the hearing and the
19 exhibits related to that. So you made that ruling.
20 What's interesting and what I'm concerned about is
21 that Dr. Neeper seems to indicate that he wants to
22 propose some type of conversions or he wants to
23 propose some changes to the tables. Yet he filed no
24 modifications.

25 We filed our -- the public notice clearly

1 said we are going to file -- Petitioners are going
2 to make their changes, and the public, if they want
3 to make modifications to the changes, are to file
4 them by December 24th. That did not occur so it
5 would be inappropriate for them to come in now and
6 suggest modifications to the tables that they never
7 filed.

8 Now, they can certainly present evidence
9 on our changes. They can certainly cross-examine
10 witnesses about our changes, but they are not in a
11 position today to somehow offer some modifications
12 for changes to the tables. They are not the
13 applicant and they missed their deadline.

14 CHAIRPERSON BAILEY: Mr. Smith?

15 MR. SMITH: I would just like to say,
16 first of all, Dr. Neeper, for someone that had very
17 little time to answer the motion, you did an
18 admirable job. Based on Dr. Neeper's arguments, I'm
19 not sure that the ruling that the Commission just
20 made conflicts with what Dr. Neeper wants to do. It
21 sounded to me as though Dr. Neeper, when he began to
22 testify, would be able to explain how the exhibits
23 and the testimony that he aims to give would fall
24 within the parameters of what the Commission has
25 noticed up as the purpose of this hearing. And

1 given your ruling that you would not exclude
2 witnesses, I'm assuming that means that you will not
3 exclude exhibits until you have heard how they are
4 going to be used and objections that may be lodged
5 at the time. If that's the case, I don't think
6 Dr. Neeper has been heard quite yet.

7 CHAIRPERSON BAILEY: Commissioner Balch?

8 DR. BALCH: When I examine the New Mexico
9 Citizens' prehearing statement, I had no issues at
10 all with what they propose to present to us. I
11 thought it was completely within the context of what
12 we had asked to understand; in particular, if you do
13 the conversion, what happens to the values. We need
14 to know that.

15 As far as drawing conclusions, I think
16 that's left to us so I don't have a problem with his
17 summary statement, and like Mr. Smith just said, we
18 will have a chance to hear testimony and rebuttal
19 from both sides on exhibits and view them as
20 appropriate.

21 CHAIRPERSON BAILEY: Commissioner Bloom?

22 COMMISSIONER BLOOM: I would agree with
23 Commissioner Balch. We asked that the measurements
24 be framed in one method, and in doing that, I think
25 that will naturally lead us to wonder what the

1 impacts of the new values or translated values might
2 be, so I would be interested in hearing what
3 Dr. Neeper and the Citizens for Clean Air and Water
4 have to say on the matter.

5 CHAIRPERSON BAILEY: I agree with the
6 other commissioners. I look forward to hearing
7 Dr. Neeper's testimony, and if there are objections
8 to particular slides of Exhibit 6 then we can deal
9 with that as they arise, but do I hear a motion from
10 the Commission to deny NMOGA's Motion to Exclude a
11 Portion of Exhibit 6 and related testimony
12 identified in NMCCAW's prehearing statement for the
13 January 9th hearing?

14 MR. SMITH: May I suggest that you handle
15 this in exactly the same way you handled the motion
16 for OGAP? You have set forth the parameters. I
17 suppose that you could deny both motions with the
18 understanding that you have clarified what testimony
19 and exhibits may address and then move forward so
20 that your denial is only on the notion of excluding
21 in limine, as Mr. Jantz points out, but that you are
22 clearly stating the limits to what will be heard
23 today. It seems to me if you want to do it, deny
24 them both, but you are, as I appreciated, limiting
25 what you will hear today based on the arguments that

1 Industry made.

2 CHAIRPERSON BAILEY: Then do I hear a
3 motion to that effect?

4 DR. BALCH: I will make a motion that we
5 deny both of the motions and then limit the
6 testimony in the manner we discussed.

7 COMMISSIONER BLOOM: I second that.

8 CHAIRPERSON BAILEY: All in favor? Aye.
9 Okay. That brings us to opening statements for a
10 clarification of the rule-making hearing
11 participation, which is OCD Rule No. 3 on
12 rule-making so that there is clarification that the
13 Commission will hear non-technical testimony. A
14 person may testify and present an unsworn statement
15 in the rule-making hearing. A person does not need
16 to file prior notification with the commission clerk
17 to present non-technical testimony at the hearing.
18 Members of the general public who wish to present
19 non-technical testimony should indicate their intent
20 at a sign-in sheet at the hearing. We have sign-in
21 sheets right there by the back door for any members
22 of the public. There will be adequate time before
23 lunch and at the end of the day to hear comments
24 from the public who have signed in.

25 This Commission will also hear technical

1 testimony in which persons will present technical
2 testimony or cross-examine witnesses, only limited
3 to those people who have filed particular
4 statements. The Commission shall conduct the
5 hearing so as to provide a reasonable opportunity
6 for all persons to be heard without making the
7 hearing unreasonably lengthy or cumbersome and
8 without unnecessary repetition. I refer anyone who
9 is interested in these details for rule-making
10 authority to reference 19.15.3, which has to do with
11 rule-making.

12 MR. SMITH: I think it would be
13 appropriate before you begin to take evidence to ask
14 the presenters and the lawyers here to bear in mind
15 the limits that you all have placed on the evidence
16 that you aim to take and not to try to push it into
17 areas beyond those limitations.

18 CHAIRPERSON BAILEY: I'm sure everyone
19 heard those comments and yes, they will be enforced.
20 All right. Opening statements for new testimony?

21 MR. FELDEWERT: Madam Chairman, members of
22 the Commission, I think I already previewed what we
23 are going to do. What Dr. Clay Robinson has a Ph.D.
24 in soil science and he is going to discuss the EPA
25 testing methods that have been identified in the

1 revisions and why they and how they fit with the
2 units of measurement that currently exist in the
3 table and why those units of measurement have to
4 remain the same with respect to those testing
5 methods. We will point out that's how laboratories
6 do it. The way the table is structured is
7 scientifically sound.

8 He will also address the fact that there
9 is no conversion when you are using those EPA
10 testing methods from milligrams per liter back to
11 milligrams per kilogram and he will explain why.

12 It might be helpful as we go through the
13 testimony -- I have our exhibits that we have filed
14 with tabs on them because I suspect the copies you
15 have may not have tabs, so I do have some extra
16 copies here. I can get up to you through my
17 assistant perhaps so that you have those available
18 to flip through as we go through the testimony.
19 It's not going to take very long. I suspect about
20 an hour, and you will have questions and others will
21 have questions, but that's what we are prepared to
22 present here today.

23 CHAIRPERSON BAILEY: You may begin.

24 MS. FOSTER: If I may make a brief
25 statement on behalf of the IPANM. As a result of

1 the Commission's order on November 15th, the
2 Independent Petroleum Association met with NMOGA and
3 members of Industry and we talked about these tables
4 and the limitations in the order, and we tried to
5 meet the demands of the Commission in the November
6 15th order. At this time IPANM will not be
7 introducing a witness. We have worked with NMOGA
8 and their witness and we support the testimony to be
9 presented by the NMOGA witness. However, we will
10 reserve our right to present a rebuttal witness if
11 necessary.

12 CHAIRPERSON BAILEY: Mr. Jantz, do you
13 have a statement?

14 MR. JANTZ: OGAP does not.

15 CHAIRPERSON BAILEY: Dr. Neeper?

16 DR. NEEPER: Madam Chairman, we will
17 attempt to stay within the limits discussed. We
18 will be presenting methods for doing conversions of
19 units which we believe the Commission has requested
20 and we will try to express the limits in terms of
21 various units without altering the limits or without
22 giving any reasons why those limits should be
23 altered. If they are altered, that is entirely up
24 to the Commission.

25 CHAIRPERSON BAILEY: You may proceed.

1 MR. FELDEWERT: We will call Dr. Clay
2 Robinson to the stand.

3 DR. CLAY ROBINSON
4 after having been first duly sworn under oath,
5 was questioned and testified as follows:

6 DIRECT EXAMINATION

7 BY MR. FELDEWERT

8 Q. Please state your full name for the record
9 and identify for the Commission your occupation.

10 A. Clay Robinson. I am a soil scientist.

11 Q. Mr. Robinson, if I turn to what's been
12 marked as NMOGA Exhibit 21, is that your current
13 resume?

14 A. It is.

15 Q. Did you prepare this document?

16 A. I did.

17 Q. Does it accurately reflect your
18 educational background and work experience?

19 A. It does.

20 MR. FELDEWERT: Madam Chair, I move the
21 admission of NMOGA Exhibit 21.

22 CHAIRPERSON BAILEY: Any objection?

23 MR. JANTZ: None.

24 CHAIRPERSON BAILEY: It is admitted.

25 (Note: NMOGA Exhibit 21 admitted.)

1 Q. You summarized your qualifications on the
2 screen here?

3 A. I have.

4 Q. It indicates you hold a Ph.D. in soil
5 science from Iowa State University?

6 A. That's correct.

7 Q. You obtained that in 1993?

8 A. Yes.

9 Q. You are currently a soil scientist?

10 A. That's true.

11 Q. What is a soil scientist?

12 A. A soil scientist is an applied scientist
13 that uses various supporting science or pure
14 sciences -- biology, physics, chemistry, ecology,
15 geology -- integrates all of those in the
16 application to soil in various things, whether it's
17 in natural resources management, agriculture,
18 ecology and restoration. All these things are
19 components of what a soil scientist does.

20 Q. So do you go beyond just soil physics?

21 A. I do.

22 Q. Your resume notes that you have some
23 registrations and certifications on the upper
24 right-hand corner.

25 A. Yes.

1 Q. Would you please just identify them for
2 the Commission and explain to them what goes into
3 those, to the acquisition of those certain types of
4 certifications?

5 A. I am a certified professional soil
6 scientist. This is a certification by the Soil
7 Science Society of America. It requires a certain
8 minimum of core coursework, summarized up here if
9 you'd care to look, but coursework in soil
10 morphology and classification and genesis, so how
11 did soils get to be there and how do you look at
12 them and how do you describe them; what are the
13 relationships between those soils and landscapes.
14 Soil chemistry and mineralogy, so what's in the soil
15 and then how does that work, how does that affect
16 other properties in the soil. Soil fertility and
17 nutrient management, so some of these nutrients that
18 we're going to talk about today, chloride, for
19 example, is a nutrient that plants need and so
20 there's some components there in terms of managing
21 nutrients and in soil fertility that come into play.

22 Soil physics. Soil physics looks
23 essentially at how water, air and heat move through
24 soil as well as other soil physical properties.
25 Soil biology and ecology, those are the resources,

1 how do plants exist on the landscape and the
2 organisms within the soil that live there and those
3 relationships. And then land use management, how
4 does soil affect the choices that we make in
5 managing land. So that's the primary core of
6 courses that a soil scientist should have.

7 For the certification, an individual
8 that's seeking certification does not have to have
9 all of these but has to have a minimum competency of
10 coursework in most of these. With my Ph.D. I have
11 had coursework in all of these areas. Then there's
12 an additional supporting set of coursework
13 associated with agricultural sciences, biological
14 and ecological sciences, chemistry, math, physics,
15 statistics, communications, geoscience as well as
16 human health and land use and some water sciences.
17 So these are -- again, an individual who is seeking
18 certification does not have to have coursework in
19 every one of these, but has to have established a
20 minimum competency in these areas.

21 Once that's been documented, a person
22 seeking certification is required to pass two exams.
23 The first one is a general knowledge exam, and the
24 second one is a professional practice exam. So the
25 first one is just primarily facts, and the second

1 one is application of those facts using scenarios
2 and case studies.

3 Then a person seeking certification is
4 required to have a minimum of five years experience
5 at a bachelor's level or master's or Ph.D., a
6 minimum of three years of experience on top of the
7 degree. So these are the minimum competencies
8 required for a person to qualify as a certified
9 professional soil scientist and then be recognized
10 as one who is qualified to practice soil science in
11 the United States.

12 Q. How long have you been a certified
13 professional soil scientist?

14 A. Since 1999. That makes it about 13 years.

15 Q. And do you currently serve in some
16 capacity with regard to the certification?

17 A. Yes. I am also on the Council of Soil
18 Science Examiners. This is the body of soil
19 scientists selected from around the nation who are
20 responsible for developing these two exams, that
21 basic knowledge exam and then that professional
22 practice exam. So we come together and we meet
23 yearly to work on those questions, to craft the
24 questions, to define the minimum competencies of a
25 practicing soil scientist.

1 Q. Are there continuing educational
2 requirements associated with your certification?

3 A. A certified professional soil scientist
4 must have 40 continuing education units, 40 hours
5 every two years, including one hour in professional
6 ethics, and then the other hours of those are
7 obtained through attending professional meetings for
8 soil science, reading and writing professional
9 articles, manuscripts and other things similar to
10 that.

11 Q. It also indicates that you are licensed as
12 a professional geoscientist in soils in Texas?

13 A. Yes. This is a relatively new category
14 but it's analogous to a professional engineer. For
15 many areas a professional engineer needs that
16 license in order to practice their science. The
17 professional geoscientist is a growing license
18 around the United States to qualify people to
19 practice soil science in various states. Texas has
20 this and I am licensed in Texas. New Mexico does
21 not yet have a professional geoscientist license, so
22 my license is good in Texas and other states that
23 have cooperative agreements with Texas.

24 Q. Now, your resume reflects that in 1994 you
25 began teaching at West Texas A & M University?

1 A. That's correct.

2 Q. What was the nature of your teaching
3 obligation?

4 A. I had a full-time teaching appointment.
5 That meant that I taught essentially 15 semester
6 credit hours every semester. Those were classes in
7 beginning soil science, soil fertility, soil
8 morphology and classification, irrigation, soil and
9 water conservation, soil and plant relationships,
10 soil physics class once. It also involved teaching
11 the labs associated with those classes and soil
12 profile description and introductory soils and some
13 soil fertility kinds of labs and nutrient --
14 characterizing nutrients, analyzing nutrients that
15 are in the soil and then also some supporting
16 courses in range and forage crops as well as
17 introductory horticulture and coursework in
18 undergraduate and graduate statistics classes.

19 Q. It indicates you were tenured in 2000?

20 A. That's correct.

21 Q. And you became a full professor in 2007?

22 A. I did.

23 Q. And then you continued teaching at West
24 Texas A & M University until May of 2011?

25 A. That's correct.

1 Q. It reflects then in June of 2011 you took
2 a position as a senior soil scientist at Stetson
3 Engineering?

4 A. That's correct.

5 Q. Where does Stetson Engineering have
6 offices?

7 A. Their headquarters or primary offices are
8 in California but we also have offices in Nevada,
9 Arizona, Colorado and our one office here in New
10 Mexico and that's in Albuquerque, and I work out of
11 that Albuquerque office.

12 Q. What have been your general job
13 responsibilities since June of 2011?

14 A. Among many things, but primarily relevant
15 to this hearing, characterizing soil properties on
16 landscapes, and those properties include primarily
17 physical and chemical properties, and then how those
18 properties are related to the various ecosystems in
19 which they exist.

20 Q. What type of projects have you worked on
21 that would be related to your discussion here today
22 since you became a senior soil scientist at Stetson
23 Engineers?

24 A. I have done a lot of land classification,
25 walking out on landscapes and describing soils. We

1 have done topsoil assessment and survey associated
2 with an environmental impact statement for a
3 hardrock mine looking at what soil is there that
4 they can harvest and then when reclamation comes
5 about could reuse, or materials that could be used
6 for topsoil materials. I've looked at the impact or
7 potential impacts of removing a pipeline and how
8 that would affect soil and related revegetation
9 impacts, and then examining soil chemistry and other
10 characteristics and how they would impact vegetation
11 requirements and potential revegetation.

12 Q. Have you been recognized as an expert in
13 soil science by any judicial administrative body?

14 A. I was recognized as an expert in soil
15 science in an administrative body before the Nevada
16 State Engineer and I was recognized by a judicial
17 panel in an arbitration as a soil science expert in
18 Potter County, Texas.

19 Q. As a result of your education and work
20 experience, are you familiar with testing methods
21 for determining inorganic impounds such as
22 chlorides?

23 A. I am.

24 Q. In solids and leachates?

25 A. Yes.

1 Q. How do these testing methods relate to the
2 work that you have done over the last 20 years?

3 A. Testing methods for compounds in soil,
4 whether they are agricultural, soil fertility or
5 environmental, have similar basic foundations. And
6 so I began working with these primarily when I was
7 on my Ph.D. doing analysis of things and becoming
8 familiar with testing methods. I continued that in
9 my teaching through teaching on some of these
10 methods, on basic principles and properties of how
11 these methods work, both there are usually two
12 procedures, an extraction and an analysis, so
13 teaching on those and taking students to tour labs,
14 to keep current not only for them but for me on the
15 methodologies of both the extraction and the
16 analyses.

17 And then since starting at Stetson I have
18 continued that with -- because some of the projects
19 on which we have worked have required me to be
20 familiar with these methodologies and how they
21 apply.

22 Q. Do you have an NMOGA Exhibit 20 in front
23 of you?

24 A. I do.

25 Q. I invite you and the Commission to turn to

1 Page 41 of NMOGA Exhibit 20.

2 MR. FELDEWERT: Madam Chair, as a matter
3 of procedure, this was filed with our Notice of
4 Corrections, so I guess out of an abundance of
5 caution I will move the admission of NMOGA Exhibit
6 20 which I previously described earlier this
7 morning.

8 CHAIRPERSON BAILEY: Any objections?

9 MR. JANTZ: No.

10 CHAIRPERSON BAILEY: It is admitted.

11 (Note: NMOGA Exhibit 20 admitted.)

12 Q. Are you familiar, Dr. Robinson, with the
13 tables that NMOGA has proposed on Page 41 of this
14 Exhibit 20?

15 A. I am.

16 Q. Are you generally familiar with how they
17 are referenced and utilized in the proposed rule
18 changes?

19 A. Yes.

20 Q. And in particular, are you familiar, based
21 on your work experience, with how EPA Method 300.0
22 that we see after Chloride in Table 1, how that
23 works?

24 A. Yes.

25 Q. And are you familiar, based on your work

1 experience, with how EPA Method SW-846, Method 1312,
2 which we see for chlorides in Table 2, how that
3 process is utilized and how it works?

4 A. Yes.

5 MR. FELDEWERT: At this point I tender
6 Dr. Robinson as an expert in soil science and
7 related testing methods for inorganic compounds.

8 CHAIRPERSON BAILEY: Any objections? He
9 is so admitted.

10 Q. Dr. Robinson, based on your experience and
11 your knowledge as an expert, are the EPA testing
12 methods identified for chlorides in Tables 1 and 2
13 appropriate for the type of material being tested
14 under these tables?

15 A. They are. Table 1 is for soils and EPA
16 300.0 has an appropriate provision for testing
17 soils. Table 2 is for wastes, and the combination
18 of the SW-846 Method 1312 as an extraction and the
19 Method 300.0 for analysis is appropriate for those
20 wastes.

21 Q. Based on your experience and expert
22 knowledge on these EPA testing methods, is it
23 appropriate and necessary to measure chlorides in
24 milligrams per kilogram in Table 1 and milligrams
25 per liter in Table 2?

1 A. It is, because in Table 1 we begin with
2 solid materials, with soils, and because we begin
3 with those soils it's appropriate to report those
4 units in milligrams per kilogram. In Table 2
5 though, our Method 1312 is designed to test
6 mobility, and it does not begin with dry soils and
7 so it never takes something to a dry component that
8 would allow you to convert units, so milligrams per
9 liter are the appropriate unit for Table 2 for
10 chlorides.

11 Q. And do these testing methods in the
12 corresponding units comply with laboratory
13 standards?

14 A. They do.

15 Q. Based on your experience and expert
16 knowledge, is there a laboratory standard for
17 converting milligrams per liter to milligrams per
18 kilogram for the type of material tested under Table
19 2?

20 A. Not when you begin with Method 1312, there
21 is not.

22 Q. Now, to understand your opinions, I want
23 to first discuss with you how Tables 1 and 2 are
24 utilized in this proposed rule, okay?

25 A. Yes.

1 Q. So staying within NMOGA Exhibit 20, if you
2 would please turn to Page 24. On Page 24 we find --
3 for reference purposes you looked at previously Page
4 23 at the bottom. By the time we get to Page 24 we
5 are in Section 17.12D and over on Page 24 we see
6 17.12D6, which based on the title addresses impacted
7 soils found in the removal and placement of
8 below-grade tanks; is that correct?

9 A. That's correct.

10 Q. And you will see a reference to Table 2 in
11 17.12D6 in connection with testing requirements for
12 soils beneath the below-grade tank.

13 A. Table 1.

14 Q. I'm sorry, Table 1. Thank you.

15 A. Yes, that's correct.

16 Q. If I'm understanding this correctly, if
17 the impacted soils beneath the below-grade tank
18 exceed Table 1 standards then the operator is to
19 proceed with 17.13 closure methods?

20 A. That's correct.

21 Q. The next place that we find Table 1
22 utilized in this rule is over on Page 26, and we are
23 within Section 17.13 and I see Table 1 referenced as
24 part of 17.13A3, A, B and C; is that correct?

25 A. Correct.

1 Q. And here we are dealing with impacted
2 soils beneath a pit or a below-grade tank; is that
3 correct?

4 A. That's correct.

5 Q. And again, if the impacted soils exceed
6 Table 1 then a division may require additional
7 mediation; is that correct?

8 A. Correct.

9 Q. If the impacted soils do not exceed the
10 Table 1 standards then they are backfilled with
11 non-waste containing material and they are covered
12 in contour pursuant to the closure provision.

13 A. That's correct.

14 Q. And then the only other place where Table
15 1 is cited within this rule is found then on Page
16 28, and for reference purposes we are still within
17 Section 17.13, but by the time we get to Page 28 we
18 are under Subsection B, correct?

19 A. I believe that's correct.

20 Q. If I start on Page 26 --

21 A. That's correct.

22 Q. -- at the bottom. So we are dealing there
23 with where wastes are destined for burial in place
24 or into nearby Division approved pits or trenches,
25 right?

1 A. That's correct.

2 Q. And we see Table 1 referenced over on Page
3 28 in Section 17.13B9 A, B and C; is that right?

4 A. Correct.

5 Q. And again, the same holds true. There's
6 testing of these wastes, and in this case we are
7 dealing with wastes beneath a pit liner. I'm sorry,
8 with impacted soils beneath the pit liner.

9 A. That's correct.

10 Q. Because the liner and the waste will
11 already have been removed?

12 A. That's correct.

13 Q. Again, it requires testing of the impacted
14 soils beneath the pit. If they meet the Table 1
15 standards you proceed with closure?

16 A. That's correct.

17 Q. If they do not, then there's additional
18 action that's required?

19 A. That's correct.

20 Q. All right. So in summary, the way Table 1
21 is applied here, it's applied, as I understand it,
22 to impacted soils, correct?

23 A. That's correct.

24 Q. That are beneath a lined pit or a
25 below-grade tank.

1 A. Correct.

2 Q. Now, if I then go to Page 41, which are
3 the tables, does the title of that table, is it
4 consistent with how Table 1 is used within the rule?

5 A. Yes. The title says that these are
6 closure criteria for soils beneath pits and
7 below-grade tanks, and that is consistent with the
8 appropriate sections that we have just addressed.

9 Q. Okay. So with this understanding of how
10 it's used, you testified that EPA Method 300.0 is an
11 appropriate method for testing chlorides in these
12 impacted soils beneath a pit or below-grade tank.

13 A. That's correct.

14 Q. Now, I would like to have you turn to
15 what's been marked as NMOGA Exhibit 22. Do you
16 recognize this exhibit?

17 A. I do.

18 Q. Did you assist in putting it together?

19 A. I did.

20 Q. And it's comprised of how many pages?

21 A. Four pages.

22 Q. Are you familiar with the publication that
23 is referenced on the first page of the exhibit?

24 A. "Method 300.0, Determination of Inorganic
25 Anions by Ion Chromatography." This is an extract

1 of a larger document that's 28 pages.

2 Q. Is this an official EPA publication?

3 A. It is.

4 Q. Is it available to the website or by other
5 means?

6 A. It is.

7 Q. Are the four pages that you have chosen
8 here, are they accurate copies of the pages from
9 this official EPA publication?

10 A. They are.

11 MR. FELDEWERT: I would move the admission
12 of NMOGA Exhibit 22.

13 CHAIRPERSON BAILEY: Any objections?

14 MR. JANTZ: No.

15 CHAIRPERSON BAILEY: Admitted.

16 (Note: NMOGA Exhibit 22 admitted.)

17 Q. Dr. Robinson, would you please explain,
18 using first this exhibit, why EPA Method 300.0 is
19 appropriate for testing the soils that are the
20 subject of Table 1.

21 A. If you would look on the second page of
22 this exhibit under the scope and application, Part
23 A, 1.1 Part A identifies that chloride is one of the
24 components that can be analyzed by this method.
25 Under Section 1.2.1 highlighted up here what the

1 matrices applicable to the method are, it can be
2 used to sample drinking water, surface water,
3 groundwater, reagent water, wastewater and
4 leachates, but there's also a component in 300.0 for
5 analyzing solids. Our concern in Table 1, those
6 solids are going to be soils after an extraction,
7 and 300.0 defines the extraction for those solids.

8 Q. If I go to third page of the exhibit
9 there's a section, Summary of Method, correct?

10 A. Yes.

11 Q. And there's a Section 2.3 that again
12 references that extraction procedure for solids that
13 you just referenced, Section 11.7?

14 A. That's correct.

15 Q. Then if I go to the last page of the
16 exhibit, does it describe that extraction process,
17 11.7?

18 A. It does, and a key point in that is in the
19 second line. It says, "Add an amount of reagent
20 water equal to ten times the weight of the dry solid
21 material." So if you would allow, I will give a
22 brief summary of how this Method 300.0 works.

23 Q. Let me ask you first, you said the key
24 term is weight of dry solid material.

25 A. Yes.

1 Q. How does a lab, for example, get to a dry
2 solid material?

3 A. Common laboratory practice for when you
4 see the word dry means dried to a constant weight.
5 Technically what that means is it's been dried at a
6 temperature slightly above boiling, typically 105
7 degrees C for approximately 12 to 24 hours until it
8 reaches a constant weight so you are dealing with a
9 dry mass of the material that's going to be tested,
10 and that's the common laboratory practice when you
11 see the word dry.

12 Q. Then would you please briefly explain for
13 the commissioners the process that is 300.0 with the
14 11.7 extraction process?

15 A. Again, this is a much larger document. I
16 will summarize briefly how it's used in testing
17 these solids for now. So this is our Method 300.0
18 based on this extraction that's defined in 11.7 for
19 solid materials. In our case those solids are
20 soils.

21 So again, we begin with these dry solids,
22 which in practice, common laboratory practice means
23 oven-dried. So you start with an oven-dried soil.
24 The ratio is defined as ten parts of reagent water
25 to one part of the mass of that dry soil. You mix

1 that together for a certain amount of time and then
2 you filter it. You collect the filtrate and you
3 feed it into the ion chromatograph which is the
4 analysis method. So you have an extraction again
5 and an analysis.

6 This ion chromatograph has been calibrated
7 to provide units in milligrams per liter because of
8 the way we established the standards. Take a
9 certain amount of chloride, put it into a liter of
10 distilled deionized water and you have got a
11 standard amount in milligrams per liter. Then you
12 look at the reading from the instrument, and based
13 on the standards it gives you an output in
14 milligrams per liter.

15 However, that's not the end of the story
16 because now we started with an oven-dried solid, and
17 oven-dried mass of those soils, and so since we
18 started with a known dry mass, we can convert
19 directly from milligrams per liter to milligrams per
20 kilogram using that oven-dried mass, which is what
21 allows us to come to a concentration of the
22 chlorides in that soil of milligrams per kilogram.

23 Q. Dr. Robinson, is it appropriate and
24 necessary to use milligrams per kilogram as the unit
25 of measurement?

1 A. It is.

2 Q. Where EPA Method 300.0 is used for soils
3 beneath lined pits and below-grade tanks?

4 A. It is.

5 Q. When you are testing these soils, are the
6 results always reported by labs in milligrams per
7 kilogram?

8 A. When testing soils the results are always
9 reported in milligrams of whatever the element is
10 per kilogram of soil, and that really means kilogram
11 of dry soil.

12 Q. So if I'm an operator out there and I go
13 out and do the testing that's required by the rule
14 for the purposes of Table 1 and I get my soil
15 samples and I take them to the lab and I say, "Test
16 this using EPA Method 300.0," am I going to get
17 results in milligrams per kilogram?

18 A. Yes, you are.

19 Q. Are the test results on these dry soils
20 ever reported in milligrams per liter to someone
21 like an operator?

22 A. No, they would not be.

23 Q. And why is that?

24 A. Again, it's the beginning point. If you
25 start with that the soil that we dry, we are

1 concerned about the concentration of the element, in
2 this case chlorides, that's present in that dry
3 soil. And the dry soil is always used as the
4 reference point in this and in soil
5 characterization, so the units are always in
6 milligrams of the element per kilogram of the dry
7 soil.

8 Q. I want to now turn to the topic of Table
9 2. And I want to again use NMOGA Exhibit No. 20,
10 but first provide a textural reference as to where
11 Table 2 is utilized within the proposed rule
12 submitted by NMOGA. And the only place it was
13 utilized, Dr. Robinson, is on Page 27 of NMOGA
14 Exhibit 20, and again, by reference to the prior
15 Page 26 we are within Section 17.13. And we find
16 the textural reference to Table 2 on Page 27 in
17 Section 17.13B 5, 6 and 8.

18 A. That's correct.

19 Q. In this circumstance, what is involved are
20 the contents of lined pits, below-grade tanks and in
21 some circumstances dry goods, correct?

22 A. That's correct.

23 Q. For someone in your profession, when you
24 are dealing with these types of contents, how do you
25 describe those wastes? What's the common parlance?

1 A. These are mixed-phase wastes. Now, I will
2 give some definition for what that is similar to
3 when my soil physics professor came in and he said
4 soil was a dynamic heterogeneous free-phase media.
5 What does that mean? Well, mixed-phase waste means
6 that there is still some liquid in those. An
7 undefined amount. They are not saturated by any
8 means, so the first step with these wastes is they
9 must pass a paint filter test.

10 If you think of a sponge for a moment, if
11 you take the sponge and put it in the sink and get
12 that thing completely wet, when you take the sponge
13 out of the sink, water drains out of the sponge.
14 That's like the paint filter test. There's a point,
15 though, where all the water that's going to drip out
16 of the sponge has dripped out of the sponge.

17 These mixed-phase wastes have that same
18 characteristic. There's a lot of soil physics and
19 properties of capillaries and properties of surface
20 area of the waste itself that determine how much
21 water is going to drip out freely under just the
22 influence of gravity. So that's what a mixed-phase
23 waste is.

24 Q. Okay. The sections here that reference
25 Table 2 on Page 27, they determine if the contents

1 of lined pits, below-grade tanks or drying pads can
2 be buried on-site?

3 A. That's correct.

4 Q. So if they meet the Table 2 standards they
5 can be buried on-site pursuant to the closure
6 provisions?

7 A. That's correct.

8 Q. If they do not, they have to be dealt
9 with?

10 A. That's right.

11 Q. Okay. That's the only place within this
12 rule in which Table 2 is used?

13 A. That's correct.

14 Q. If I then go back to Page 41, does the
15 title to this Table 2 correspond to the textual
16 references that we just examined?

17 A. It does. These are the closure criteria
18 for wastes left in place in temporary pits and
19 burial trenches.

20 Q. So we are not dealing here in Table 2 with
21 impacted soils?

22 A. No, we are not characterizing soils in any
23 way with this method with this table.

24 Q. And here where we are addressing the
25 contents of these pits, lined pits or below-grade

1 tanks, for chlorides there is a method that's
2 described as EPA SW-846 Method 1312 SPLP, correct?

3 A. That's correct.

4 Q. And then in conjunction with that there's
5 another reference then to EPA Method 300.0.

6 A. That's correct.

7 Q. We have looked at 300.0 but would you then
8 turn to what's been marked as NMOGA Exhibit 23. It
9 has in bold in the first page the EPA symbol and
10 then SW-846 Online, correct?

11 A. That's correct.

12 Q. Do you recognize this exhibit?

13 A. I do.

14 Q. Did you assist in putting it together?

15 A. I did.

16 Q. Is it comprised of seven pages?

17 A. It is.

18 Q. Are you familiar with the publication from
19 which these -- let me ask you, are these pages an
20 extraction from an official EPA publication?

21 A. Page 1 is the official EPA web page that
22 is the overall page for the suite of methods known
23 as SW-846 for water quality. The second page is
24 from an introductory web page, again from the EPA
25 site addressing another subset of those methods, and

1 then the last five pages of this are an extract of
 2 Method 1312, which is a larger document of 30 pages.
 3 So we have extracted five of the 30 pages for you.

4 Q. Were the documents utilized here public
 5 documents?

6 A. They are.

7 Q. Available on the EPA website or by other
 8 means?

9 A. They are.

10 Q. And pages that you have chosen, are they
 11 accurate copies of the pages from these official EPA
 12 publications?

13 A. They are.

14 MR. FELDEWERT: Madam Chair, I move the
 15 admission of NMOGA Exhibit 23.

16 MR. JANTZ: No objection.

17 CHAIRPERSON BAILEY: It is admitted and
 18 let's take a ten-minute break.

19 (Note: NMOGA Exhibit 23 admitted.)

20 (Note: The hearing stood in recess at
 21 10:37 to 10:47.)

22 CHAIRPERSON BAILEY: We have just admitted
 23 your Exhibit No. 23, I believe.

24 MR. FELDEWERT: Yes, and I want to stay on
 25 Exhibit 23.

1 Q. Dr. Robinson, just to put everything
2 together, if I look at the first page of Exhibit No.
3 23 on the right-hand side, I see a reference to a
4 1000 series, correct?

5 A. That's correct.

6 Q. Then if I go to the second page at the top
7 in bold is 1000 series methods?

8 A. Correct.

9 Q. And if I go down that column to almost the
10 bottom I see Method 1312.

11 A. Yes.

12 Q. Then if I go to the third page, this is
13 then the first page of Method 1312?

14 A. Right. This is the first page of these
15 five that are extracted from that 30-page
16 publication that entails the entire method.

17 Q. Now, we reviewed the combination of
18 testing methods that are listed in Table 2 for
19 chlorides which included this SW-846 Method 1312 and
20 Method 300.0.

21 A. Correct.

22 Q. Is this combination of EPA testing methods
23 appropriate when dealing with the contents of lined
24 pits, below-grade tanks and drying pads?

25 A. It is appropriate, yes, to determine the

1 mobility of the contents of those pits.

2 Q. If I look at Page 3 of our Exhibit 23,
3 Method 1312, there's a Section called 1.1 and it
4 says Method 1312 is assigned to determine mobility,
5 correct?

6 A. That's correct, as we noted up here just
7 as a summary. This is a synthetic precipitation
8 leaching procedure. It is designed to determine, as
9 it says here, the scope and application 1.1,
10 designed to determine the mobility of both organic
11 and inorganic anolytes that are present in liquids,
12 soils and wastes, and the focus here is on the
13 wastes and these inorganic anolytes, that would be
14 in this case chlorides.

15 Q. If I go down to Section 2.2, your
16 reference there is separating the liquid phase as
17 appropriate from the solid phase, correct?

18 A. That's correct.

19 Q. They use the term throughout that section
20 "solid phase." How does that solid phase referenced
21 in here differ from the dry solid that you discussed
22 earlier when addressing 300.0?

23 A. It might be useful to begin a little bit
24 of an overview of this method in answering that
25 question because they have a different definition

1 for what a solid phase is. If you read through this
2 entire method, as in 300.0 with soils, they said dry
3 solid material. This one just said solid phase. So
4 a quick overview of the method will take us at least
5 to answer that question.

6 So the first question that this asks is
7 are these wastes mixed-phase or are these materials
8 that go in mixed-phase. And go back a few minutes
9 ago. We talked about that sponge. You got it wet,
10 you took it out, water drained freely by gravity and
11 so it passes a paint filter test.

12 Is that sponge dry? I asked my students
13 questions like this all the time when I was
14 teaching. And the answer is of course it's not.
15 It's still got water in it. It just won't flow out
16 under the influence of gravity. That's what the
17 paint filter test identifies.

18 So then the next thing is well, if there's
19 some water in it or liquid in it, can I get some of
20 that out? And so the answer is yes. How do I get
21 that out? Well, the sponge, you might just squeeze
22 it gently. If the answer is yes here in this
23 method, what they do is take that material and they
24 put it on a glass filter and then they gradually add
25 air pressure onto it to force some of that liquid

1 out. And they gradually increase the pressure to 50
2 PSI, 50 pounds per square inch. So that's the
3 pressure at which they are pushing water out. So
4 they are using a pressure extraction technique in
5 this method.

6 So the question then is well, so I add the
7 pressure, I catch whatever comes out of that filter
8 in one side and that's my liquid phase as this
9 method has defined it. Is that stuff on the filter
10 dry? And the answer is still no, because the
11 definition of dry, you will remember, is oven dry.
12 So this material is nowhere close to oven dry
13 because it's just had pressure applied to it.

14 Fifty PSI -- and I know the Commission has
15 heard testimony on plants and things, so they have a
16 frame of reference. Fifty PSI is approximately
17 three bars. If you remember, and it's long time to
18 remember for your quiz, 15 bars is approximately the
19 limit for what many agricultural plants can readily
20 take water from the soil. That's a moving target
21 and it's plant dependent. But for the purposes of
22 this quiz and this concept, three bars is nowhere
23 near 15 bars, so there's still a fair amount of
24 liquid in this stuff that remains on the filter.

25 Well, how much liquid is in that, you

1 might ask? And the answer is, unfortunately, it
2 depends. It depends on the physical and to a degree
3 on the chemical characteristics of that waste
4 product. What did they put in the pit? What were
5 they using as their drilling fluids? Were they
6 using drilling mud? What was the nature of the
7 stuff they were drilling through? All of those
8 things determine how much water is left in the stuff
9 that's still on the filter when you put 50 PSI of
10 pressure on it, and it can range a couple order of
11 magnitudes actually on what's still in there,
12 depending if you had a really course sand versus a
13 bentonitic, smectitic drilling mud. Sorry, those
14 are hard words.

15 Q. Dr. Robinson, you mentioned something to
16 me when I was trying to visualize this. Is it like,
17 you said, having a sponge with large holes versus
18 small holes? I might squeeze it, put pressure, and
19 if it has larger holes I get more water out than it
20 does if it has smaller holes? Is that a good
21 analogy?

22 A. That's correct. So the way this method
23 defines the solid phase is what is left on that
24 glass filter? This material is what is defined as
25 the solid phase. This material is not dry, and in

1 this method, this material is never dried so we
2 don't have a frame of reference for, you know,
3 what's the amount of dry solids that are in that
4 waste. That's never done in the context of this
5 method. It defines solid phase as what's left on
6 the filter after I put my pressure through it and
7 collected the stuff that drips out on the side.

8 Q. Just before we leave that point, and
9 before we continue here, if I look at our Exhibit 23
10 and I look at the page at the bottom that says
11 1312.6, about two or three pages from the end,
12 there's a section in there at 7.0 which is titled
13 Procedure, and down below there in Section 7.1.1 on
14 Page 1312.6, is that where it defines what the solid
15 phase is that they are referencing?

16 A. Yes. This defines the percent solids as
17 that fraction of a waste sample as a percentage of
18 the total sample from which no liquid may be forced
19 out by an applied pressure. So we are applying our
20 pressure. Once we have the 50 PSI everything drips
21 out, it's at equilibrium. I can't force any more
22 liquid out. That's what we defined in this method
23 as the solid phase.

24 They can calculate their percent solids
25 here as a fraction of the total mass that you

1 started with. And again, a quick distinction from
2 this and from soil science, soil science does not
3 use that total mass as the frame of reference. Soil
4 science always uses the dry mass of the soil as the
5 frame of reference.

6 Q. In this definition here when it says "by
7 defined pressure," it defines the pressure that you
8 applied there, correct?

9 A. The maximum pressure that's applied there
10 is 50 PSI.

11 Q. And in my parlance it determines how much
12 you squeeze the sponge?

13 A. Right. How strong are you when you
14 squeeze the sponge. If you squeeze it gently and
15 then a little bit harder and at some point you stop
16 squeezing.

17 Q. Then would you continue with how this
18 Method SW-846 Method 1312 is utilized?

19 A. So once I have my undried solid phase,
20 what remained on the filter, I weigh that material,
21 and again, it's got an unknown quantity of water in
22 it that's related to the physical and chemical
23 properties of the material itself, of that waste. I
24 take an acid extractant. The pH is 4.2, a
25 relatively strong acid, and I mix it with this solid

1 phase material.. This provides us a worst case
2 scenario of mobility because it dissolves other
3 things that water would not.

4 Once I have mixed that together, I filter
5 it, and again I collect the liquid, the filtrate
6 from that. This now gives me two legs in Method
7 1312. One of them was if I had liquid in it to
8 start with and it's been pushed out, and I've got
9 that liquid phase filtrate. Then I have got another
10 leg that was when I mixed my solid phase with the
11 acid extractant and I have a filtrate.

12 Both of these then go to the next step,
13 and the question is are these two filtrates
14 compatible? What that means is if you mix them
15 together will they stay mixed or will they separate?
16 If they stay mixed, the method says well, combine
17 them. If they will separate, the method says well,
18 do them separately.

19 So what do we do? Well, again, you can
20 either combine them or you don't combine them, you
21 take all three of them back to the same spot.
22 Because now I have done an extraction. If you go
23 back to the beginning I said that all test methods
24 essentially have two components, an extraction and a
25 way to determine what's in it once I extracted it.

1 So I go to my Method 300 again to determine how much
2 chloride is in this stuff that's been extracted, how
3 much is in these filtrates.

4 Method 300.0 for liquids and filtrates is
5 shorter, simpler. Because now I start with
6 something that's a liquid rather than a solid when I
7 was dealing with soils. So I don't have to use an
8 extraction; I already have a liquid. I put it in
9 the instrument that's been calibrated to read in
10 milligrams per liter, and I get my chloride
11 concentration now in milligrams per liter as the
12 output from my machine.

13 So now then I'm not done with Method 1312
14 yet. We are just to this point where we now have
15 chloride concentrations. Actually, I am done if I
16 could combine my waste streams. If I could combine
17 the two filtrates, I'm done. If I had to run those
18 separately then I do a volume weighted average.
19 Volume times concentration plus volume times
20 concentration divided by total volume. So I get a
21 weighted mean, and the answer in that, again, is
22 milligrams per liter.

23 So my output from the combination of
24 methods in Table 2, Method SW-846 Method 1312 as the
25 extraction and Method 300.0 for analysis in

1 determining the mobility of these chlorides in the
2 waste is in milligrams per liter.

3 Q. So if I take the contents of these pits --
4 if I'm an operator and I take the contents of these
5 pits after I've gone through the paint filter test
6 and I have this analyzed by a laboratory using
7 Method SW-846 Method 1312 as my extraction process
8 and 300.0 as the analysis, would the laboratory's
9 results be in milligrams per liter?

10 A. They will.

11 Q. Is it practical for operators or
12 laboratories to then convert the milligrams per
13 liter results from the EPA testing methods into
14 milligrams per kilogram?

15 A. It is not. Because 1312 method does not
16 provide the data to make that conversion.

17 Q. You don't have the dry mass?

18 A. You do not have a dry mass upon which to
19 base those concentrations.

20 Q. Now, I want to shift gears for one minute.
21 Do you have the Exhibit 6 that has been proffered by
22 New Mexico Citizens for Clean Air and Water by way
23 of their prehearing statement?

24 A. Yes.

25 MR. FELDEWERT: I would ask the Commission

1 to indulge us and pull that out for one moment.

2 Q. I want to go to a slide. Page 3 of that
3 particular exhibit, which is one of the pages that
4 was not the subject of our motion.

5 DR. NEEPER: Just a question of procedure,
6 Madam Chairman? This is beginning to sound like a
7 rebuttal prior to testimony.

8 MR. SMITH: I think he can enter whatever
9 testimony he wants to at this point and then
10 Dr. Neeper can address that.

11 CHAIRPERSON BAILEY: In his direct?

12 MR. SMITH: Yes or in his cross, whenever
13 the man wants to.

14 MR. FELDEWERT: Again, this is not one of
15 the slides that we filed an objection to.

16 CHAIRPERSON BAILEY: Then Dr. Neeper, your
17 objection is overruled and you will have the
18 opportunity to address that at a later time.

19 Q (By Mr. Feldewert) Now, as I read this,
20 Dr. Robinson, and if I'm wrong, perhaps Dr. Neeper
21 can let me know, but it seems to suggest that you
22 can simply multiply the milligrams per liter results
23 from the EPA testing methods by 20, by a factor of
24 20, to come to a milligrams per kilogram result?

25 A. That's what this does seem to be, what

1 this slide purports.

2 Q. Is that correct?

3 A. The 20 comes from the extraction ratio. I
4 said we had a solid phase -- again, this solid phase
5 is not dry -- and we had an acid extractant, strong
6 acid extractant that was added in a 20 to one ratio,
7 so that's where the 20 is derived on this. However,
8 this implied conversion here is not technically
9 feasible and sound because that one kilogram of
10 solid waste that he is showing here as a starting
11 point is not dry. So there's no dry mass that you
12 know at the beginning in order to allow a
13 concentration conversion from a volume, milligrams
14 per liter, to a mass, milligrams per kilogram.

15 If you had a dry mass of that solid waste
16 you could make that conversion, but Method 1312
17 never requires in this process -- well, let me
18 rephrase that. Method 1312 does not require you to
19 find the oven-dry or the dry solid mass. It just
20 uses the mass of that material that remains on the
21 filter, never sees an oven, so you never know what
22 is the dry mass of that material. So you do not
23 have a reference point to make this conversion.

24 Q. So the process doesn't provide for any
25 kind of a drying of the mass?

1 A. The process does not provide that.

2 Q. So would it be inconsistent with
3 laboratory processes to simply take the one
4 milligram per liter result from EPA 1312 and
5 multiply by 20 to come up with a milligrams per
6 kilogram measurement?

7 A. It is inconsistent with standard
8 laboratory practice.

9 Q. So would a laboratory using Method 1312
10 multiply the milligram per liter results by 20 to
11 get milligrams per kilogram?

12 A. They would not.

13 Q. Would a soil scientist using Method 1312
14 take the milligrams per kilogram results and
15 multiply -- I'm sorry, take the milligrams per liter
16 results and multiply by 20 to get milligrams per
17 kilogram?

18 A. No, they would not.

19 Q. If I was an operator and went to a
20 laboratory and said, "Use EPA Testing Method SW-846
21 and 1312 along with 300.0" and told them I wanted it
22 reported in milligrams per kilogram, would they do
23 that in their laboratory practices?

24 A. Not if they were a reputable lab. That
25 violates standard laboratory practice.

1 Q. So as an expert, just to finalize this, in
2 soil science and in these testing methods, in your
3 opinion is it scientifically accurate to take the
4 milligrams per liter results from EPA 1312 and
5 multiply by 20 to get milligrams per kilogram?

6 A. It is not.

7 Q. Now, I want to look at the origin of EPA
8 SW-846 Method 1312, okay?

9 A. Okay.

10 Q. Again, by way of background, that was
11 always in the proposal submitted by NMOGA. The only
12 difference is it was in a footnote rather than
13 directly -- it was in an asterisk for the Method
14 column rather than directly in the Method column,
15 but I want to go to the origin of the testing.

16 If you turn to Exhibit No. 20, NMOGA
17 Exhibit No. 20, and in particular I would like to go
18 to Page 34. Now, Dr. Robinson, this particular page
19 is in a series of pages that were proposed to be
20 stricken by NMOGA and essentially replaced with the
21 tables to make it a little simpler. On Page 34 we
22 are dealing with, if you look at the prior page,
23 on-site trench burial.

24 A. Yes.

25 Q. If I look at Page 34 under Subsection C,

1 little C, in reference to chlorides under the
2 existing rule, there is noted here the use of EPA
3 SW-846 Method 1312; is that correct?

4 A. That's correct.

5 Q. That's the same method that's in NMOGA's
6 current tables?

7 A. It is.

8 Q. That has not changed?

9 A. It has not.

10 Q. The only thing that has changed is rather
11 than EPA method 300.1 NMOGA has suggested that the
12 method be changed to 300.0.

13 A. That's correct.

14 Q. Is that an appropriate change, in your
15 opinion?

16 A. It is.

17 Q. Why is that, briefly?

18 A. Let me provide a bit of background here
19 that outlines or a brief contrast and comparison of
20 the methods. In 300.0 in general for soils and then
21 we will talk about the thing for pit contents,
22 because 1312 is followed by the analysis technique
23 in 300.0 for the pit contents, again, the big
24 difference between these in terms of finding out
25 units at the end is related to whether or not the

1 materials are dry. Method 300.0 defines dry solids.
2 Method 1312 defines its solid phase through pressure
3 extraction.

4 We already summed this up. We know dry
5 mass for soils so we can do a unit conversion. We
6 don't know a dry mass when we are working with
7 Method 1312. We cannot.

8 Now, why would NMOGA propose using Method
9 300.0 as opposed to Method 300.1? In general, 300.0
10 is broader, more general purpose. 300.1 has a
11 specific purpose. The similarities between these
12 methods are both can be used to look at
13 concentrations in reagent water, in groundwater, in
14 surface water and there's a subtle distinction
15 between drinking water in 300.0 and finished
16 drinking water in 300.1.

17 Now, that distinction is associated with
18 again this purpose of these methods. 300.1, in
19 looking at finished drinking water, is considering
20 methods to determine lower concentrations of
21 chlorides or whatever the anions are. So it's using
22 larger volumes to go through the instrument in order
23 to detect low concentrations. The limit is, I
24 believe, .002 milligrams per kilogram, so that would
25 be about two parts per billion for frame of

1 reference. So it's a very sensitive method for low
2 concentrations.

3 Again, for our 300.0, it's also
4 appropriate for wastewater and leachates and our
5 solids after extraction. So general purpose versus
6 specific, solids defined on how to do it for 300.0
7 and 300.1 there is no provision in 300.1 for testing
8 solids. So 300.1 is entirely inappropriate for
9 Table 1. For Table 2, you could use it but there's
10 really no point because you are not dealing with two
11 parts per billion, you are dealing with much higher
12 concentrations, and 300.0 determines those
13 completely adequately.

14 Q. Let me have you turn to what's marked as
15 NMOGA Exhibit 24. Do you recognize this exhibit?

16 A. I do.

17 Q. Did you assist in putting it together?

18 A. I did.

19 Q. Is it comprised of three pages?

20 A. It is.

21 Q. And are you familiar with the publication
22 referenced on the first page of this exhibit?

23 A. I am.

24 Q. Are these pages an extraction from that
25 publication?

1 A. These three pages are extracted from the
2 40-page document that completely defines and
3 describes Method 300.1.

4 Q. As with the other documents we have seen
5 of this nature, is this an official publication of
6 the EPA?

7 A. It is.

8 Q. And a public document available for
9 review?

10 A. It is.

11 Q. And are the pages that you have copied
12 accurate copies of the pages from this particular
13 document?

14 A. They are.

15 MR. FELDEWERT: Madam Chair, I move the
16 admission of NMOGA Exhibit 24.

17 CHAIRPERSON BAILEY: Any objection?

18 MR. JANTZ: No objection.

19 CHAIRPERSON BAILEY: It is admitted.

20 (Note: NMOGA Exhibit 24 admitted.)

21 Q. And you have already referenced the
22 differences here. The only thing I want to go to is
23 the second page of this Exhibit 24 under Section
24 1.0, Scope and Application. In particular Section
25 1.1 identifies what you have just discussed, and

1 that is the reach of Method 300.0, is it not?

2 A. That is correct.

3 Q. Has the Oil Conservation Division,
4 Dr. Robinson, previously recognized EPA Method 300.0
5 as an appropriate substitute for addressing the
6 types of waste that were involved in Tables 1 and 2?

7 A. They have.

8 Q. If I turn to what's been marked to NMOGA
9 Exhibit 25, have you reviewed this memorandum prior
10 to today?

11 A. I have.

12 Q. And it's the official memorandum from the
13 New Mexico Energy, Minerals and Natural Resources?

14 A. Yes.

15 Q. By its face it appears, does it not, to be
16 a public document?

17 A. It does.

18 Q. Issued by the Division on July 24, 2008?

19 A. Correct.

20 Q. And it contains the signature of the
21 Division Director, Mark Fesmire at that time, does
22 it not?

23 A. It does.

24 Q. Is this the memorandum that you referenced
25 where the Division previously recognized EPA Method

1 300.0 as appropriate for the types of wastes being
2 addressed under the Pit Rule?

3 A. Yes, it identifies that 300.0 is an other
4 approved method with the extraction utilizing
5 deionized water.

6 MR. FELDEWERT: I move into evidence NMOGA
7 Exhibit 25.

8 CHAIRPERSON BAILEY: Any objection?

9 MR. JANTZ: I object on foundation. The
10 witness isn't the author of this memorandum and
11 NMOGA hasn't offered any testimony as to the
12 voracity of the contents or any nuances to the
13 contents, and as somebody who is not the author, the
14 witness can't testify to that.

15 CHAIRPERSON BAILEY: Any other comments?
16 It is a public document issued by the Energy,
17 Minerals and Natural Resources Department. It will
18 be admitted.

19 (Note: NMOGA Exhibit 25 admitted.)

20 Q (By Mr. Feldewert) Dr. Robinson, I am just
21 about finished. I want to wrap some things up. If
22 we go back to Page 41 of NMOGA Exhibit 20 where we
23 are talking about the changes that have been made in
24 NMOGA's proposal with respect to the EPA testing
25 methods in the Method column, particularly and only

1 with respect to chlorides, looking at Table 1, in
2 your expert opinion is EPA Method 300.0 as
3 referenced in Table 1 the appropriate testing method
4 for addressing chlorides in impacted soils
5 underneath a liner or a below-grade tank?

6 A. It is.

7 Q. In your expert opinion, is milligrams per
8 kilogram the appropriate and necessary unit of
9 measurement where EPA Testing Method 300.0 is
10 utilized for those types of soils under pits and
11 below-grade tanks?

12 A. It is the appropriate unit.

13 Q. Then look at Table 2. In your expert
14 opinion, is the combination of EPA Method SW-846
15 Method 1312 and EPA Method 300.0 the appropriate
16 testing method for addressing chlorides in the
17 contents of lined pits, below-grade tanks and drying
18 pads?

19 A. It is the appropriate method for testing
20 the mobility of those chlorides in those pit wastes
21 to be left in place.

22 Q. In your expert opinion, is milligrams per
23 liter the appropriate and necessary unit of
24 measurement where this combination of EPA testing
25 methods are utilized?

1 A. It is the appropriate unit because the
2 foundation to convert to milligrams per kilogram is
3 not available through Method 1312.

4 Q. In your expert opinion, are the testing
5 methods and corresponding units of measurement for
6 chlorides set forth in these tables feasible for
7 operators and laboratories to follow and apply?

8 A. They are.

9 Q. And finally, Dr. Robinson, is it
10 appropriate and necessary to have two tables as
11 NMOGA has proposed here?

12 A. In order to answer that, let's try to give
13 a brief synopsis of how these tables are used and
14 what is their purpose. So the first question is are
15 we dealing with soils beneath pits, below-grade
16 tanks, so under the liners, under those tanks. If
17 the answer is yes that we are dealing with the soils
18 beneath those pits or tanks, we are dealing with
19 Table 1 and using Table 1 to address those soils.

20 Method 300.0 is appropriate. It measures
21 the concentration of those -- in this case we are
22 dealing with chlorides. It measures the
23 concentration of chlorides in those soils,
24 characterizes those soils beneath the pit and
25 beneath the tanks. And because it's dealing with

1 soil, milligrams per kilogram is the appropriate
2 unit.

3 If our answer up there was no, we are not
4 dealing with soils, well, in this case our option is
5 we are looking at wastes that are left in place in
6 temporary pits and burial trenches. We have got
7 those mixed-phase wastes we defined earlier. And
8 that's the purpose of Table 2. And Table 2 uses the
9 combination of SW-846 Method 1312 as the extraction
10 procedure to determine the mobility and EPA 300.0 to
11 measure the concentration, and the appropriate units
12 because of the structure of Method 1312, the
13 appropriate units have to be milligrams per liter.

14 Q. So in your opinion is it appropriate and
15 necessary to have the two tables as NMOGA has
16 proposed?

17 A. It is.

18 Q. Is it appropriate and necessary to have
19 the two different units of measurement for chlorides
20 as proposed in NMOGA's tables on Page 41 of Exhibit
21 20?

22 A. It is.

23 MR. FELDEWERT: Madam Chair, the only
24 thing I have left then is if you would like -- I
25 would like to admit, I guess, as NMOGA Exhibit 26

1 the demonstrative slides that Dr. Robinson has put
2 together and which has been refined over the last
3 couple of days to bring the testimony down to as
4 short as possible in the interest of time. They do
5 nothing more than present in a summary format the
6 exact testimony that he has just provided here in
7 the record, and I suggest it might be helpful to
8 have that as you are reviewing the record.

9 CHAIRPERSON BAILEY: Any objections?

10 MR. JANTZ: No objection.

11 CHAIRPERSON BAILEY: Then Exhibit 26 is
12 admitted. Do you have copies for the Commission and
13 the reporter?

14 MR. FELDEWERT: I do.

15 (Note: NMOGA Exhibit 26 admitted.)

16 MR. SMITH: May I ask a question? When
17 you say the demonstrative slides, you are talking
18 about giving a hard copy of what the Commission just
19 viewed on the screen; is that correct?

20 MR. FELDEWERT: Yes, sir. With that,
21 Members of the Commission, that concludes our
22 presentation of the witness.

23 CHAIRPERSON BAILEY: Before we start
24 cross-examination, it's 11:30. We can take lunch
25 now, which would help people going to restaurants in

1 Santa Fe. And we can continue at 12:30, taking an
2 hour for lunch. This seems to be a logical break.
3 We will definitely take public comments right now,
4 but this seems to be a logical time for that break.
5 We have had a request for an hour and a quarter
6 which brings us back at a quarter to 1:00. Any
7 comments? No one signed in for public comment so we
8 will be in recess.

9 MR. JANTZ: Before we break, I have a
10 quick question. If it's okay with the Commission,
11 Dr. Neeper and I have agreed that he will conduct
12 cross-examination first before OGAP, and OGAP will
13 follow in the cross-examination of the witness.

14 CHAIRPERSON BAILEY: I see no reason why
15 we can't do that.

16 MR. JANTZ: Thank you.

17 (Note: The hearing stood in recess at
18 11:30 to 12:45.)

19 CHAIRPERSON BAILEY: I believe it is time
20 for Dr. Neeper to cross-examine the witness; is that
21 correct?

22 MS. FOSTER: Actually, as the petitioner
23 of the case, I think I have the opportunity to
24 question the witness.

25 CHAIRPERSON BAILEY: Of course. I'm

1 sorry, Ms. Foster.

2 MS. FOSTER: Thank you. Actually, at this
3 time, given the limited scope of the testimony that
4 occurred this morning, IPANM will not ask the
5 witness any questions. Thank you.

6 CHAIRPERSON BAILEY: Now, Dr. Neeper?

7 CROSS-EXAMINATION

8 BY DR. NEEPER

9 Q. Good afternoon.

10 A. Good afternoon.

11 Q. The only solid substance that I see
12 discussed in the rule tables is chloride. Why are
13 we focusing on chloride? Why does the soil science
14 focus on chloride?

15 A. In the soil system, chloride is
16 essentially the most mobile, most soluble, and
17 therefore potentially the most mobile element that
18 is common in the soil and in the wastes we are
19 talking about.

20 Q. So therefore, for example, if we had a
21 plume of material leaching out into the soil,
22 chloride would be the logical thing to look for at
23 the leading edge to see how far it went; is that
24 correct?

25 A. As a tracer, yes.

1 Q. So if chloride is highly mobile, why is it
2 necessary to have an elaborate leach test including
3 acids?

4 A. I did not design the EPA SW-846 Method
5 1312 test. They have chosen to use this method and
6 the acid extractant as the method specifies to
7 determine the mobility of the elements, in this case
8 the inorganic and anion chloride, to identify the
9 mobility, and those are the inputs in terms of this
10 that have been used in other models to look at how
11 that chloride is moving. So if you -- again, that's
12 the purpose of the test. That's why it's there and
13 that's what the Commission has used in the previous
14 rule and that's the one that's continued to be
15 proposed here.

16 Q. But the previous rule dealt with many
17 other contaminants that are much less mobile; is
18 that correct?

19 A. I don't know. I haven't reviewed the
20 previous rule in detail.

21 Q. Very good. You have shown a few tables
22 and the tables are treating regarding pit waste on
23 the one hand and the other table is treating soils
24 and you have distinguished them. Why are pit wastes
25 inherently different from soil?

1 A. Well, there are several reasons for which
2 these materials are different. First, when we are
3 talking about soils, the materials beneath the pit
4 or under a below-grade tank, those materials
5 underneath those are relatively undisturbed, and
6 they have the physical characteristics, properties
7 of soils, and subsoil materials. There's a lot of
8 variability in these materials, depending on how
9 they got there and what their source was. Did
10 they -- you know, a lot of the areas where the wells
11 are associated with which I'm familiar are in old
12 ancient riverbeds and so they have alluvial
13 materials.

14 Well, those are inherently different from
15 something that formed in a windblown sediment or
16 something that formed from bedrock that's
17 decomposing in place. So there's a variety of
18 different physical properties and chemical
19 properties related to the nature of how that soil
20 came to be, but those properties are relatively
21 undisturbed when you dug out a pit or a tank and
22 it's the material below it.

23 The contents of the pit are entirely
24 different in their nature. First, there's a lot of
25 liquid in them initially because there's liquid

1 that's used as part of the drilling process. These
2 drilling fluids have a lot of, depending on which
3 kind of drilling fluid they are using, they have a
4 lot of variable properties themselves. If they
5 happen to use the drilling muds that are high in
6 these smectitic clays, those are very much different
7 than the standard soils that are underneath one of
8 those pits. If they are drilling -- depending on
9 the formations through which they are drilling,
10 there's a lot of different materials that may be
11 brought up as they're drilling and dumped into a
12 pit. So there's a tremendous variability of the
13 properties in the pit, these wastes, depending on
14 the drilling materials and fluids that were used and
15 the formations through which they were dug. So
16 these materials are vastly different in their
17 properties and characteristics.

18 And then there's also some differences
19 relative to what's going to be done with these
20 materials when you're done, when you're finished.
21 One of them is going to be at least proposed to be
22 left in place covered, and the other one is just
23 going to be covered with up to four feet or four
24 feet of material.

25 So there's a difference in the materials

1 themselves and there's a difference in how they will
2 be handled once it's finished.

3 Q. But both of these sets of materials,
4 obviously, are really porous media; is that not
5 correct, that appear like soils?

6 A. They are porous media. As a physicist
7 they are free-phased porous media. There is some
8 air in there, too. You have to be careful with a
9 soil scientist saying that something is like soil
10 because the pit contents are nothing like soil.
11 They are a free-phased porous media. They have
12 liquids, they have solids and in that connection
13 they have similar properties as soils.

14 Q. But you are maintaining then that they
15 would be inherently different from what you might
16 find under a leaking tank or what you might find
17 under a leaky pit?

18 A. Yes, I am, because of the nature of the
19 drilling fluids that are used and the nature of the
20 formations that are being drilled through. Some of
21 those drilling fluids are extremely different.
22 Again, I will pick on drilling muds, smectitic
23 clays, extremely high shrink/swell capacities. They
24 can hold up to 250 percent of their dry weight in
25 water. Native soils are nothing like that. So very

1 dramatically different properties potentially
2 depending on the nature of how that well was
3 drilled.

4 Q. Is the mobility of chloride inherently
5 different, particularly when you use an exhaustive
6 ten to one or 20 to one leachate?

7 A. You've asked about the ten to one or 20 to
8 one, so those are references specifically to Method
9 300.0 and Method 1312. The ten to one method is
10 using reagent water. That's distilled deionized
11 water. It's mixing a known quantity of dry soil
12 with ten times the quantity of water and finding out
13 how much of that, in this case chloride, comes off
14 those soil particles into solution. It's filtered
15 and then the chloride that is in that solution is
16 measured, so you have a content.

17 The 20 to one uses a strong acid, pH of
18 4.2, sulfuric nitric acid, 60 to 40 ratio. Because
19 the purpose of the test, 1312 for Table 2, 300.0 for
20 Table 1, is different. So Table 2, with that strong
21 acid, extracts -- dissolves, if you will, a lot more
22 of the chloride that is in those wastes than
23 distilled water would. And so these two methods
24 result in different amounts of chloride that are
25 present in the solution at the end, because in one

1 case you are using water and in the other case you
2 are using acid.

3 And so are the properties of chloride and
4 chloride mobility the same? Well, if you have a
5 chloride ion in the soil, yes, it will move just
6 like any other chloride ion in the soil. But
7 relative to the purpose of these tables and the
8 purpose of these methods, the amount of stuff that's
9 dissolved and the amount of chloride that's in that
10 material that's from Table 1 and a ten to one
11 extraction versus what's in Table 2 and a 20 to one
12 acid extraction, those give dramatically different
13 or potentially dramatically different results based
14 on, again, all the other things related to what's in
15 the pit contents.

16 Q. I understood you just to say a chloride
17 ion in one has mobility just like chloride ion in
18 the other. They both move with the water. Now, if
19 the chloride ion moves with the water, what
20 difference would it make the solid matrix from which
21 it came?

22 A. There are two assumptions behind your
23 question, I think. You can correct me if I'm wrong.
24 The first assumption is that this chloride ion is
25 free in a soil matrix, not contained in a pit. And

1 then the second assumption is that there is water
2 available to move that chloride ion. So what I said
3 was that, you know, this chloride ion in the soil
4 and this chloride ion in the soil are going to have
5 similar properties and similar mobilities regardless
6 of where they started, what their source is. That
7 much, that is true. Now, I'll stop there.

8 Q. So the test doesn't really know where the
9 soils came from? You flush chloride off and that's
10 what you get?

11 A. In terms of the tests themselves, once you
12 feed that liquid, that filtrate, into your ion
13 chromatograph, the ion chromatograph doesn't know
14 where the chloride ion started. That's true. But
15 the person that's running the ion chromatograph
16 knows that the materials came from different sources
17 because they know the methods they were using so
18 they apply the appropriate methodology as has been
19 specified in those exhibits that we have already
20 presented today.

21 Q. You said the 1312 leach procedure first
22 extracts as much liquid as it can by pressure and
23 then leaches with water; is that correct?

24 A. That is not correct.

25 Q. Not correct?

1 A. The leach that's used in 1312 is the
2 strong acid, 20 to one, 4.2 pH, 60 percent, 40
3 percent sulfuric acid, nitric acid. It does not use
4 reagent water in 1312.

5 Q. I stand corrected. If the
6 pressure-produced liquid does not separate, then the
7 two liquids are later combined. Did I understand
8 you to say that correctly?

9 A. That's what the method allows. You have
10 got the extract from the solid phase with the acid
11 and what came out through the pressure filtration.
12 If those will mix without separating, then they
13 combine those two filtrate streams.

14 Q. For an imaginary kilogram of testing
15 material, about how much water might be extracted by
16 the pressure or how much liquid -- I should use that
17 term?

18 A. There is no way to know without looking at
19 the material because it could be anywhere from
20 nothing, if the material starts out relatively dry,
21 to essentially a weight equal to the dry mass of the
22 solid phase of the soil solid. That's not soil --
23 the dry mass of those pit contents.

24 Q. So at the extreme case, the mass of the
25 liquid might be as great as the dry mass of the

1 testing material?

2 A. There are potentially circumstances where
3 it might be -- well, I would have to look at things
4 in more detail because there are many properties of
5 the physical properties that affect how much water
6 will come out under pressure and there's really no
7 way to give you an approximate that would fit all
8 cases.

9 Q. Very good. You gave us the maximum and --

10 A. Well, I wouldn't say that's an absolute
11 maximum.

12 Q. Not an absolute. Are you aware that pit
13 contents are very often mixed with clean soils to
14 make a substance that will bear some weight?

15 A. They can be mixed up to a ratio of three
16 to one.

17 Q. Three to one?

18 A. According to the rule.

19 Q. Therefore, they might tend to take on more
20 of the properties of soils than strictly the
21 properties of the mud; is that correct?

22 A. I suppose that would depend on what you
23 meant by the properties.

24 Q. I will clarify that. We have in our minds
25 some of this waste material and probably it's been

1 mixed with some soil, if you can imagine that. The
2 amount of water contained therein is not -- in most
3 cases if it's going to be load-bearing -- greater
4 than the porosity of that solid material. Is that a
5 fair assessment?

6 A. That would be a fair assessment. Let me
7 qualify that though. Unless there's a high
8 proportion of those drilling muds. Because those
9 drilling muds will hold water not only in the pores
10 or the porosity, the pore space between particles,
11 but drilling muds will also hold water in the
12 layers. If you would imagine that a drilling mud is
13 a little bit like a deck of cards or a sheet of
14 papers like this, other particles hold only water --
15 or traditional soil particles, rock, gravel -- hold
16 water only on the outside of the particle and in the
17 spaces between separate particles. But drilling
18 muds have this unique ability to expand and hold
19 little shelves of water between every one of the
20 layers because they are called layer silicates.
21 They have the ability to hold water between every
22 one of those little layers of the clay particle, the
23 drilling mud. So in that case they can hold a
24 substantially greater amount of water than the
25 porosity of the matrix.

1 Q. With that knowledge, what would be the
2 error in assuming that essentially all of the
3 chloride appeared in the leached fluid? And we know
4 volume of the leached fluid.

5 A. Are you making reference now to the Method
6 1312 or to Method 300.0? For soils or for the pit
7 contents?

8 Q. For the pit contents, and I will clarify
9 this. Let us assume I had a kilogram of material
10 and it went through the leach procedure and I knew
11 how much chloride was in the leached fluid. Some
12 chloride may be also in the fluid that was pushed
13 out by pressure. If I have simply analyzed or took
14 the amount of chloride in that leached fluid and
15 related it back to the mass of solids that I started
16 with -- and you're saying I don't know the mass.
17 But if I dry that mass, what would be the error?
18 You have criticized -- I will clarify this further.
19 You have criticized my 20 to one ratio. What would
20 be the error in that 20 to one ratio?

21 A. In terms of just making a simple
22 multiplication as you proposed?

23 Q. Well, should it have been 40 to one or is
24 the error 20.4 to one? Is it a small fraction or a
25 large fraction of the 20?

1 A. Again, there's not a simple, easy answer
2 for this because the properties of the waste, as I
3 have already told you, can vary dramatically based
4 on things like particle size. What do you start
5 with? Well, is there a lot of gravel-sized
6 particles, which are defined as those between two
7 millimeters or just under a tenth of an inch all the
8 way up to something that's about three inches in
9 diameter or effective diameter gravel?

10 So if there's a lot of gravels it's a
11 different material than if you have sand-sized
12 particles, which are the ones that are kind of
13 course and gritty and hence the name that we have of
14 sandpaper. And the numbers that you see on
15 sandpaper are associated with the size of the
16 screens, so the size of the sandpaper, those little
17 gritty things.

18 Or if you have silt-sized particles which
19 if you are thinking about that and want a
20 connection, think about flour. Roughly the same
21 size as flour. Or the clay-type particles, which
22 are very tiny, have this kind of characteristic and
23 can hold dramatically different amounts of water.

24 So I can't say it's always this or always
25 that, but I can tell you that it could be in some

1 cases as much as an order of magnitude difference,
2 ten times sometimes. So in general maybe not, but
3 in some cases it can be a dramatically different
4 amount where it's related to the clays, drilling
5 muds. Because they have just a huge amount of
6 ability to hold water. Up to two-and-a-half times
7 their weight in water they can hold at least,
8 sometimes more.

9 So depending on the nature of the material
10 you can have at least a factor of two, three, four
11 times kind of commonly. It could be that error.
12 And in some cases much more extreme.

13 Q. But that water would have come out with
14 the pressure test.

15 A. No, it will not come out with the pressure
16 test. That water on those clays particularly is
17 held so tightly that it can only come out by
18 oven-drying. And then, just as a matter of note
19 that's not relevant to this, if you keep increasing
20 the temperature, those clays hold water so tightly
21 that they will continue to lose water if you ramp up
22 the temperature to two or three or 400 degree C.
23 Because they hold so much water and so tightly that
24 even oven-drying doesn't get rid of all the water.
25 But it gets us to a standard, so that's why we

1 define standard as a temperature and a constant
2 weight for what we mean as dry.

3 Q. The tables show Method 300.0 for both
4 waste and soil. Why can't both be leached by the
5 same procedure?

6 A. In answering the question why can't they
7 both be leached by the same procedure, technically,
8 physically they could. But if what you want to know
9 is to characterize the amount of chloride in the
10 material below a pit or a tank and you want to know
11 the concentration of that, proposing that you use
12 300.0, leaching or mixing the solids, dry solids
13 beneath that pit with a ratio of ten parts reagent
14 water to one part dry soil, analyzing it and finding
15 the concentration of chlorides in that material,
16 characterizing the soil that way.

17 If you only wanted to know the
18 concentration of the materials in the pit and
19 weren't concerned with mobility the way that it's
20 been defined by the EPA in SW-846 Method 1312, then
21 certainly you could use 300.0, and only consider the
22 concentration. But it does not provide the answer
23 that EPA SW-846 Method 1312 provides, which is
24 mobility, and it does not provide the input that has
25 been used in the models to look at chloride movement

1 in the soils or in the vadose zone beneath the pits.

2 So if you are only interested in
3 concentration, absolutely, you could use the same.
4 But if you truly are interested in mobility of the
5 contents of that pit, that's where Method 1312 comes
6 in because that's how the EPA has chosen to monitor
7 or to determine mobility is with that method.

8 Q. And is it your understanding then that we
9 should not be concerned with the mobility of
10 chloride underneath the pit where a pit has leaked
11 or underneath a tank where the tank has leaked?

12 A. Well, again, you are dealing with
13 different media, pit waste versus soil. Does that
14 material under the pit have the potential -- if it's
15 got chlorides in it, do those chlorides have the
16 potential to move? Yes. What's going to cause them
17 to move? Water. Salts do not move if water is not
18 there to move it. So since water is our only issue
19 of concern there, then the 300.0 that uses reagent
20 water, which is actually purer water than you will
21 ever find in a soil solution, it's going to measure
22 the amount of chloride that is soluble in that
23 matrix, those materials that are under the pit. So
24 it's measuring the solubility of the chloride, how
25 much of the chloride can come -- if you take a glass

1 and you pour some salt in it, get some water in it
2 and you stir the glass, the salt dissolves. That's
3 what essentially what Method 300.0 does is you add
4 water and if there's salt there it will dissolve
5 into the water. And once the salt is dissolved, the
6 chloride is present in the water.

7 Can it move if there is a head, a pressure
8 head to force the water to continue to move downward
9 or if there's a water table below it that would
10 cause the potential for water to move upward, yes,
11 the chloride in the soil could move once it's in a
12 soluble phase.

13 Q. Thank you. I'm not sure I heard it right.
14 What we are meaning by this is once it can get into
15 the water, that's what we are concerned with, that
16 soluble phase?

17 A. When you say into the water, again, I'm
18 defining this material in the soil underneath the
19 pit at this point. You have the free-phase porous
20 media, some air, some solids and some liquids. In
21 the water is a little less -- it's not the term that
22 a soil science would use. They talk about the
23 chloride being in the soil solution. So that's the
24 liquid that exists in between those pores in the
25 soil. So in the soil solution, that's where the

1 chloride would be.

2 Q. Finally, you had said that soil science
3 always specifies in milligrams per kilogram dry
4 mass; is that correct?

5 A. For concentration of nutrients,
6 concentration of elements, contaminants like
7 pesticides or everything with which I am familiar,
8 and I have a methods book over there that's this
9 thick for soil science methodology. When we are
10 testing things in soils, we always report the
11 results in milligrams per kilogram.

12 Q. Because buried waste ultimately becomes
13 part of the soil, why then should we not talk about
14 it in terms that are common to soil science, namely
15 milligrams per kilogram?

16 A. Are you sure that buried wastes become a
17 part of the soil? Because it's my understanding
18 that you've got some sort of a liner that is going
19 to be covered on the bottom, on the sides and on the
20 top so they are excluded from the soil, if I
21 understand the closure methods and the closure
22 methods are done correctly.

23 DR. NEEPER: Madam Chairman, we may be
24 beyond the limits that are allowed in discussion in
25 this hearing. I could ask another question about

1 that but I do not wish to violate the rules, and
2 this has to do with the methods used of closure.

3 CHAIRPERSON BAILEY: If it goes beyond the
4 scope of the hearing I'm sure Mr. Feldewert will
5 object.

6 DR. NEEPER: Very good.

7 Q. My question is then, if the pit were
8 closed by mixing with soil and the mixing is done
9 with a backhoe, do you have any professional reason
10 to believe that the liner survives intact?

11 MR. FELDEWERT: Objection. I think that
12 does go beyond what we are talking about here, and
13 that is the EPA testing methods.

14 DR. NEEPER: May I answer the objection?

15 CHAIRPERSON BAILEY: Yes.

16 DR. NEEPER: The witness said that the
17 liner would contain and thereby immobilize the
18 contents of the waste. I was questioning the
19 integrity of that liner. It was the witness' own
20 words.

21 CHAIRPERSON BAILEY: The objection is
22 overruled.

23 A. And I have no opinion on that. I have not
24 observed a pit being closed. I have read the rules
25 but I have no opinion on whether that liner would --

1 the integrity of the liner would survive closure.

2 DR. NEEPER: No further questions.

3 CHAIRPERSON BAILEY: Mr. Jantz, do you
4 have any questions?

5 MR. JANTZ: I have a few.

6 CROSS-EXAMINATION

7 BY MR. JANTZ

8 Q. Good afternoon.

9 A. Good afternoon.

10 Q. Dr. Neeper asked you about the waste, pit
11 waste and soils being leached by the same procedure,
12 and your response was they could be; is that right?
13 Did I understand that correctly?

14 A. The technology does not prevent using the
15 same procedure. The purpose is what defines the
16 procedure that's used.

17 Q. Conversely, one could oven-dry pit
18 contents after dilution, three to one mixing, just
19 the same way you dry soil?

20 A. If you did, you would no longer be
21 following the protocol that's defined in Method
22 1312.

23 Q. Sure, but you could, to get a milligrams
24 per kilogram?

25 A. Physically, again, you could, but the

1 method does not allow for that. So if you did that,
2 you would be changing the methods, the defined
3 methods and how those methods are applied.

4 Q. So it's contingent on the method?

5 A. (Witness nods).

6 Q. All right. And you say the method was
7 chosen for chlorides then, the 1312, in order to
8 talk about or determine mobility of chlorides; is
9 that right?

10 A. Yes. If you look at the Exhibit 23, Page
11 23, NMOGA Exhibit 23, Page 3, which is Method 1312,
12 Page 1, Section 1.1 under Scope and Application
13 specifies, "Method 1312 is designed to determine the
14 mobility of both organic and inorganic analytes
15 present in liquids, soils and waste." So it's
16 designed to determine mobility. And the inorganic
17 for this hearing is chloride.

18 Q. So if that's the case, does that mean BTEX
19 is immobile?

20 MR. FORT: Objection. That exceeds the
21 scope of his testimony on direct. We did not get
22 into any other thing except chlorides.

23 MS. GERHOLT: Madam Chair, on behalf of
24 the Division, the parties that filed prehearing
25 statements were NMOGA, IPANM, OGAP and New Mexico

1 Citizens for Clean Air and Water and the Oil
2 Conservation Division, and the notice required that
3 to cross-examine witnesses they had to file a
4 prehearing statement.

5 MR. FORT: She is absolutely right, and I
6 did not file because I read it and the only thing
7 that was going to be discussed today was, again, the
8 limited testimony that the Commission agreed to.
9 Had I known -- I was the one who objected the
10 longest to the rebuttal testimony by OGAP because
11 they have gotten two bites of the apple and now they
12 wanted three. Had I known that they in any way were
13 going to take your order and ask for additional
14 testimony, I would have filed.

15 But the attorney for OCD is correct, I
16 didn't file one. But I'm not, in terms of asking --
17 I'm not asking any questions. But when he raises
18 BTEX, that wasn't in there. That was not advised,
19 it was just the chlorides is what he testified to,
20 and yes, if I need to sit down then somebody can
21 pick up this argument.

22 MR. SMITH: He may be laying a foundation.
23 Let him ask the question and see where he goes with
24 it.

25 MR. FELDEWERT: Can I say anything? I do

1 object. I mean, his question was about mobility of
2 BTEX, I believe, wasn't it?

3 MR. JANTZ: Yes.

4 MR. FELDEWERT: Which is certainly outside
5 of the scope of his direct. I mean, we didn't
6 discuss the mobility of any particular constituent.
7 He was here to discuss the purpose of 1312. The
8 purpose of 1312 was to address mobility. That was
9 the purpose of the testimony.

10 It's also outside the scope of what the
11 rule is all about. We are not here to revisit the
12 mobility of certain constituents but to address the
13 changes that were made to this table. I
14 respectfully disagree that I'm not sure he is laying
15 a foundation. He asked him directly about the
16 mobility of BTEX. That is not laying a foundation.
17 That is asking for an opinion and an answer which is
18 outside the scope of the hearing and certainly
19 outside the scope of what he testified to on direct.

20 MR. SMITH: I didn't understand that he
21 was. I said he may be. Why don't we ask, are you
22 laying a foundation for a further question?

23 MR. JANTZ: It does lay the foundation for
24 a policy conclusion that I would like to ask the
25 witness and it does have to do with chlorides.

1 MR. SMITH: Let him ask it.

2 CHAIRPERSON BAILEY: Objection overruled.

3 Q (By Mr. Jantz) So am I to understand that
4 BTEX is immobile?

5 A. That's outside the scope of what I was
6 asked to examine, what I was asked to prepare to do,
7 so I have no comment on that.

8 Q. Do you know, as a professional and an
9 expert in soil science, whether BTEX is mobile or
10 not?

11 MR. FELDEWERT: Same objection.

12 MR. JANTZ: Same response.

13 CHAIRPERSON BAILEY: Same overruled.

14 A. BTEX is a hydrocarbon. I'm not a
15 hydrocarbon expert so I have no opinion on the
16 mobility of BTEX. I did not prepare for that so I
17 did not review the mobility characteristics of these
18 hydrocarbons before I came in.

19 Q. But your resume indicates that you have
20 expertise in fate and transport of contaminants. Is
21 that limited to chlorides only?

22 A. Where did you see that on my resume? I'm
23 curious.

24 Q. Just give me a moment.

25 MR. FELDEWERT: Exhibit 21.

1 THE WITNESS: That would be my resume,
2 yes.

3 MR. JANTZ: Perhaps my memory failed me in
4 this case, but my question stands.

5 Q. Is your expertise -- are you only familiar
6 with movement of chlorides in soils?

7 A. I think I have answered this multiple
8 times, but had I reviewed information on mobility of
9 hydrocarbons, I could potentially answer that. I
10 have done some in the past, looked at mobility of
11 some substances, so I am not limited to chlorides,
12 but for the sake of this hearing and for the sake of
13 the materials that I prepared, I focused on
14 chlorides and I don't have a professional opinion
15 associated with the hydrocarbons.

16 Q. So you don't know whether they are mobile
17 or not?

18 A. That's -- I said I don't have an opinion
19 on that.

20 MR. SMITH: Are you saying you can't
21 answer the man's question? He didn't ask if you had
22 an opinion, he asked you a direct question. Do you
23 know the answer to that or not?

24 THE WITNESS: Well, I know that there
25 is -- I know that hydrocarbons have coefficients

1 associated with solubility that affect their
2 potential for movement just like other ions have
3 coefficients for solubility that affect their
4 movement. I have not reviewed the exact nature of
5 those coefficients to be able to answer his question
6 today.

7 MR. SMITH: So you cannot answer his
8 question?

9 THE WITNESS: Not the way he asked it
10 today. I cannot.

11 Q. (By Mr. Jantz) Let me ask for
12 clarification. When you say there are coefficients
13 that affect mobility, what does that mean in
14 layman's terms? Does that mean hydrocarbons move
15 through soil or not?

16 A. It means that things don't move the same.

17 Q. Okay, but they do move?

18 A. It depends on their coefficients. And I
19 will divert for a moment to pesticides because
20 that's what I know more about, and pesticides are
21 hydrocarbons of a sort, many of them, that have been
22 engineered, if you will, chemically, to have certain
23 effects on target organisms: Weeds, insects.
24 Depending on the nature of how those hydrocarbons
25 are put together, some of them have extremely low

1 solubility. They absorb extremely strongly to soil
2 particles and organic materials in the soil and they
3 essentially do not move at all.

4 Other organic compounds, pesticides, and
5 you may be familiar with things like Atrazine that
6 you have heard of being in groundwater, it has
7 characteristics much more similar to an anion like
8 chloride or nitrate, so it's not bound to the soil,
9 not bound to the organic material in the soil and it
10 moves freely. What I'm saying is that without
11 reviewing those coefficients for these hydrocarbons
12 listed in the table, I cannot answer his question
13 because some hydrocarbons move, others don't move at
14 all.

15 There's also some things associated with
16 chemistry and how those hydrocarbons bind with the
17 soil that affect things. So it's more complex than
18 to say yes, they move, or no, they don't. There's
19 some chemical properties that I would need to know
20 and have to review of those hydrocarbons in order to
21 answer his question, and I was not asked to prepare
22 for that for this hearing.

23 Q. Let me ask a follow-up then. Assuming
24 that hydrocarbons may move, depending, wouldn't it
25 be wise as a policy matter to test for mobility the

1 same way you test chlorides for mobility?

2 MS. FOSTER: I object. I'm sorry. The
3 change that were made and the purpose of the hearing
4 are specifically as to the standards used to test
5 for chlorides, and the standards used for testing
6 for all the other items in the table are something
7 that OGAP had the opportunity to cross-examine on
8 and discuss and present in their case on direct
9 since at least IPANM put our initial petition in,
10 which was a year ago, which was November 29, 2011.
11 So I really do feel that this is getting well beyond
12 the scope of what we are here for, specifically the
13 testing methods relating to chlorides.

14 MR. JANTZ: Again, if I may, the purpose
15 is to determine why we are using inconsistent
16 methods, units of measurement, and that's
17 directly -- my question goes directly to that issue.
18 The witness testified that chlorides were in
19 milligrams per liter because they are soluble and
20 we're concerned with mobility.

21 MS. FOSTER: That's fine if the question
22 pertained to chlorides, but it doesn't. He is
23 expanding it to hydrocarbons. He is using the term
24 generally, hydrocarbons.

25 CHAIRPERSON BAILEY: The order does not

1 specify chlorides. The order says, "These tables
2 use values that are reported as either milligrams
3 per kilogram or milligrams per liter. The table
4 should use one method of reporting for all values."
5 It's not limited to chlorides as far as the scope of
6 the hearing.

7 THE WITNESS: If that is the nature of
8 your question, I can answer that without going
9 anywhere. Methods.

10 MS. FOSTER: But before the witness
11 answers, I would like to respond to that. Madam
12 Commissioner, with all due respect, again, we are
13 here to have OGAP respond to the items that were
14 changed by IPANM and NMOGA in the table. OGAP wants
15 to reopen the entire hearing to discuss all the
16 items that are on every single line of the table. I
17 think that's well beyond your order. With all due
18 respect, I understand you just read to me the
19 portion of the order, but my understanding of the
20 conversation this morning and the discussion this
21 morning and the intent behind the commission
22 requesting for additional information was to have
23 consistent reporting levels and weight ratios for
24 chlorides.

25 MR. SMITH: Let me offer an observation of

1 the ignorant. It seems to me that the Commission
2 asked for a conversion. The response was the
3 testing method in some way or another prevents that
4 sort of conversion. If this question goes to why
5 should there be a different testing method, then I
6 think that's a fair question in the context of the
7 conversation that is being held in front of the
8 Commission right now. Originally, I thought it was
9 going to be a good objection, but I think based on
10 Mr. Jantz' response, it sounds like a fair question
11 to ask to me.

12 CHAIRPERSON BAILEY: Thank you for your
13 legal advice. The objection is overruled. The
14 question stands. If you will please repeat it.

15 MR. JANTZ: Yes.

16 Q. If mobility is the concern and that's the
17 rationale for placing chlorides -- measuring
18 chlorides in milligrams per liter versus milligrams
19 per kilogram in pit waste, and assuming that BTEX,
20 hydrocarbons may be mobile, why not test those
21 constituents for mobility as well?

22 A. Again, begging the Commission's pardon on,
23 I have not reviewed in detail the methods that are
24 cited for the hydrocarbons. However, in response to
25 the distinction and the reason the different units

1 are used, I did review these Methods 8021B or 8015M
2 with enough detail to note that they do not use the
3 same methodology and because they use a methodology
4 that does use a dry weight then they can report
5 results in milligrams per kilogram.

6 Now, we don't have a copy of those
7 exhibits here, those methods here, to look at the
8 purpose and see if the purpose of those is related
9 to mobility or not, and I did not review that in the
10 context of this meeting because I was not asked to.
11 Could you use Method 1312 and 300.0 to measure the
12 hydrocarbons? I'm not sure. I would have to review
13 those methods in more detail. But the acids that
14 are used in 1312 would have little impact on the
15 hydrocarbons. They are not going to dissolve the
16 hydrocarbons, and that's about as far as I can tell
17 you from what I know of hydrocarbons and the methods
18 that are proposed.

19 But why do you have milligrams per liter
20 in one case and milligrams per kilogram in the
21 other? As I stated repeatedly, the issue is
22 associated with the nature of the method and how the
23 method works. So a method has a purpose, and
24 because of the purpose it has a certain process, and
25 because of that process the units will either be in

1 milligrams per kilogram or milligrams per liter but
2 it's associated with the method and the process of
3 the method. Whether or not methods 8015M and 8021B
4 address mobility of those hydrocarbons, I do not
5 know.

6 Q. I think I have one more question. The
7 concern with chlorides in the waste material versus
8 the soil is mobility; is that right? That's why one
9 is milligrams per kilogram and one is milligrams per
10 liter?

11 A. The purpose of the method in Table 1 is to
12 determine the content of chlorides in characterizing
13 the materials underneath the pit or a below-grade
14 tank. The purpose of the method used in Table 2 is
15 to determine the mobility of that as the EPA methods
16 have -- SW-846 has defined mobility as it's
17 associated with water quality, which is what the
18 SW-846 suite of methods are for.

19 MR. JANTZ: I'm not going to ask my final
20 question. I think we will stop with that.

21 CROSS-EXAMINATION

22 BY MS. GERHOLT

23 Q. Good afternoon.

24 A. Good afternoon.

25 Q. Starting with the methods, EPA Method

1 300.0, you have had the opportunity to conduct that
2 method personally, correct?

3 A. I have not from beginning to end done
4 Method 300.0 as it's defined. I have used similar
5 methods, water extraction, which is the foundation
6 of that, and then the Method 300.0 uses an ion
7 chromatograph to determine the concentration. I
8 used other -- I used colorimetric methods and
9 titration methods not with 300.0. Not with
10 chlorides.

11 I have used other methods in the analysis
12 so I have not specifically used 300.0 from beginning
13 to end. I am familiar with all the processes of the
14 extraction and the analysis but I haven't done it
15 from beginning to end.

16 Q. Have you conducted EPA Method SW-846 SPLP?

17 A. I have not done that one personally.

18 Q. But you have been qualified here today as
19 an expert in these methods.

20 A. In testing methods, yes.

21 Q. In testing methods?

22 A. Not specifically related to those but more
23 generally testing methods.

24 Q. Thank you. On direct examination you
25 testified that the origin of the -- I'm going to

1 refer to it as SPLP, the 1312 -- that that method
2 could be found on Page 34 of NMOGA's Exhibit 20. Do
3 you recall that?

4 A. That it has been referenced, yes, on Page
5 34 of Exhibit 20.

6 Q. And then if I could draw your attention to
7 two lines below that, it further states "the
8 chloride concentration as determined by EPA method
9 300.1." Do you see that, sir?

10 A. Yes.

11 Q. And you also testified, and it was per
12 NMOGA Exhibit 25, that the OCD accepted Method 300
13 in place of method 300.1 for chloride. Do you
14 recall that?

15 A. It accepted it as an other approved
16 method, yes.

17 Q. Correct. So here we see the origin for
18 the SPLP method and then it would be logical that
19 the EPA Method 300 would also be acceptable?

20 A. (Witness nods).

21 Q. If I could now draw your attention to Page
22 32, Exhibit 20 of NMOGA, and specifically Paragraph
23 F2B, and this paragraph is in regards to in-place
24 burial. It would be the third line from the bottom
25 on Page 32. "As determined by EPA method 300.1 did

1 not exceed 500 milligrams per kilogram." So via the
2 EPA method 300.1 there was a milligrams per kilogram
3 concentration, correct?

4 A. Yes, there is, and 300 -- I did not have
5 anything to do with that, but 300.1 as written in
6 the method does not allow that conversion. It does
7 not specify a dilution rate, so a laboratory would
8 have had to choose the extractant soil ratio to
9 develop that and get an answer in milligrams per
10 kilogram. But yes, it provides an answer in
11 milligrams per kilogram.

12 Q. And the lab would have to choose the
13 extraction rate. For Method 300 the extraction rate
14 is ten to one; am I correct?

15 A. 300.1, the method for solids is specified
16 as ten to one. Method 300.1, if you recall, does
17 not claim to be used or to be useful to test
18 leachates, wastes or solids.

19 Q. Okay.

20 A. So at some point in the past they made the
21 wrong choice on which method to use.

22 Q. Then they corrected it by issuing the memo
23 that Method 300 could be used in place of?

24 A. Yes.

25 Q. And that could provide potentially

1 milligrams per kilogram because there is a ten to
2 one extraction?

3 A. For Table 1 if you are dealing with solids
4 or what's now Table 2, but not if you started with
5 the SPLP procedure.

6 Q. Yet Page 32 was in-place burial which was
7 waste, and there was a determination that there
8 could be a concentration presented in milligrams per
9 kilogram?

10 A. Just because it's on paper doesn't mean
11 it's correct. Again, if you follow the SPLP method,
12 it does not specify that you have to have an
13 oven-dried mass and therefore you do not have the
14 foundation to make the conversion.

15 Q. During Dr. Neeper's examination there was
16 discussion about the difference between soils and
17 pit contents. Do you recall that?

18 A. Yes.

19 Q. One of your comments in regards to soils
20 was that they're relatively undisturbed and then
21 there's different physical characteristics, correct?

22 A. Correct.

23 Q. And then pit content may contain lots of
24 liquid and that drilling fluid has a lot of variable
25 properties. Do you recall that?

1 A. Correct.

2 Q. Isn't one of those variables for the
3 drilling fluids the level of chloride?

4 A. Absolutely.

5 Q. And if you have the fluid that already
6 contains chloride, could you run Method 300.0 on
7 that fluid?

8 A. That's essentially what 1312 does. If you
9 would allow me to pull up this presentation.

10 Q. Please.

11 A. So in answering your question let's go
12 back and look here. This addresses that question.
13 If you have a liquid that can be forced out with
14 this pressure that we talked about earlier, that
15 liquid that would have chlorides in it is collected
16 and it is analyzed separately for the chloride
17 content or at least potentially. Then the solid
18 phase is mixed with the extractant.

19 Q. If I could interrupt you, this is in
20 regards to a mixed waste. What if you just start
21 with a liquid base? Why would you need to leach a
22 liquid phase?

23 A. Actually, the interesting thing about
24 Method 1312, if you begin with strictly a liquid
25 that has less than .5 percent solids -- and I

1 apologize to the Commission. We didn't print off
2 all 28, 30, 40 pages, whatever this one was. But if
3 you start with something that has less than .5
4 percent solids, so essentially a liquid, and you're
5 not dealing with a mixed phase, Method 1312 still
6 requires you to mix that liquid with the acid
7 extractant in their process.

8 Now, to answer directly your question not
9 related to this method, if you had that liquid could
10 you run Method 300.0? Absolutely. Because the
11 machine, all it knows is that you put a liquid in it
12 and it registered a certain amount of chlorides and
13 that's all the machine knows. So if you start with
14 a liquid, put the liquid in the machine, it gives
15 you a measurement.

16 Q. Would that measurement be a volumetric
17 measurement?

18 A. Yes, it's a concentration in mass per
19 volume because when we calibrate the machine
20 originally we take different beakers, if you will.
21 We put a liter of deionized water in each one and
22 estimate what the range of chloride concentration is
23 going to be, and we measure out so many milligrams
24 of chloride in this beaker, more milligrams in this
25 one, more in this one. So we have five milligrams,

1 ten milligrams, 20 milligrams of chloride per liter.
 2 We establish the standards, use the machine then,
 3 use the standards to calibrate the machine. So the
 4 readings we get from the machine are milligrams of
 5 chloride per liter because that's how we established
 6 the standards so it's volumetric.

7 Q. Staying with the differences between soils
 8 and pit contents, would you agree that another
 9 difference for that is pit contents are contained by
 10 a liner?

11 A. It's my understanding.

12 Q. Okay. And soil is not contained?

13 A. Correct.

14 Q. So we know the bottom of a pit, correct?

15 A. Yes.

16 Q. But we don't necessarily know the bottom
 17 of the soil; is that correct?

18 A. Yes.

19 Q. So if there's a spill on that soil, how
 20 would you determine where the bottom is?

21 A. Let me see if I have your question
 22 correct. Are you asking how would you determine to
 23 what depth that spill might have an impact?

24 Q. Yes.

25 A. That's the point of sampling. Now, you

1 sample to determine the plume, whether it's
2 horizontal or vertical, to determine what depth or
3 to what extent any of that movement might have
4 occurred. Now -- I'll stop there.

5 Q. One last question. In regards to the SPLP
6 procedure, this leaching procedure, you stated in
7 response to some earlier question that chloride in
8 soil and chloride in pit contents could potentially
9 both be leached by using SPLP, correct?

10 A. Correct.

11 Q. But that the pit content, that the models
12 used in measuring the mobility of those pit contents
13 nears the SPLP method; is that correct?

14 A. That's correct. Or that's my
15 understanding.

16 Q. In the models, are you referring to the
17 HELP model?

18 A. I was not here during all of those, so I
19 can't specify exactly. It's just my understanding
20 that this is the input to the models that were used.
21 The Commission knows what models were used and I
22 will have to defer to that because that's all I was
23 told that this is what is used as inputs to models
24 that were presented before the Commission.

25 Q. Thank you, Dr. Robinson. I have no

1 further questions.

2 A. Thank you.

3 CHAIRPERSON BAILEY: Mr. Dangler?

4 CROSS-EXAMINATION

5 BY MR. DANGLER

6 Q. Going back to your beginning explanation
7 of the dry sample testing, I may have misheard but I
8 wanted to make sure what I had heard. I thought you
9 had testified that there was a point in that process
10 where it was milligrams per liter?

11 A. To which method are you referring?

12 Q. I'm referring to the first, the 300.0
13 method.

14 A. For Table 1?

15 Q. Yes.

16 A. Yes.

17 Q. Okay. And I understand the problem that
18 you presented with the test for Table 2 and
19 converting that back to kilograms. Is there a
20 similar problem if you took that measurement, the
21 liter, and translated the kilograms to liters?

22 A. Again, you are referring to 300.0 for
23 Table 1?

24 Q. Yes, because in the natural process they
25 hit something that is per liter, would there be a

1 problem in taking that number rather than the number
2 they converted into, which is per kilograms?

3 A. I think it might be appropriate if the
4 Commission would allow an example of why this works
5 for Table 1 and Method 300.0 for soils. Because the
6 Commission had asked for a conversion from
7 milligrams per liter to milligrams per kilogram, if
8 that were possible, and now it may seem confusing
9 that Method 300.0 is used both in Table 1 and Table
10 2 and in different applications. In one case I told
11 you yes, in Table 1 for solids 300.0 can be used and
12 it give us units of milligrams per kilogram. In the
13 other case we are using an extraction before that
14 but we are using 300.0 and getting milligrams per
15 liter. So Dr. Robinson, what's the story? Is it
16 one or is it the other?

17 So if you allow, let's go back to one of
18 my basic soil classes here and talk about how does
19 that work and why does it work with 300.1 to use a
20 volume conversion to a mass. So let's pull some
21 assumptions. Say I have 20 grams of oven-dried
22 soil. Method 300.0 says I need a ten to one reagent
23 ratio. How much water? Ten times 20, right? So I
24 get 200 grams of reagent water that I'm adding to my
25 dry soil.

1 Based on the density, specific gravity of
2 water, we know that one gram cubic centimeter of
3 water or one gram is equal at one cubic centimeter
4 of water at 20 degree C. So essentially we get to
5 this point where 20 grams of water or 200 grams of
6 water is 200 milliliters, which is two-tenths of a
7 liter of water.

8 So we have an extraction ratio of
9 two-tenths of a liter of water to 20 grams of dry
10 soil. Let's say we put this stuff in, we collected
11 the filtrate, we run it through the instrument and
12 we get a number. This is the question that you
13 asked, Mr. Dangler, because I have a number in
14 milligrams per liter. Now what? It's a fair
15 question.

16 So now what is this: The conversion uses
17 the concentration that I got from my instrument.
18 That extraction ratio, the amount of the volume of
19 reagent water to the oven-dried mass of the soil,
20 and a unit conversion. So I have my number that I
21 got out of my instrument, 15 milligrams per liter of
22 chloride. I have my extracted ratio we looked at
23 earlier. We used 200 grams or ten times as much
24 water as dry soil. It was two-tenths of a liter for
25 20 grams of soil so I've got a ratio. Then I need a

1 conversion of how many grams are in a kilogram. So
2 there are 1,000 grams in a kilogram. As I take my
3 students through this, we have to make sure our
4 units play fairly with one another, so just showing
5 with my strikeouts here that liters cancels, grams
6 cancels.

7 So in the end we end up doing 15
8 essentially times ten, which is our ratio at the
9 beginning and we get 150 milligrams of chloride per
10 kilogram of dried soil. And then because we are a
11 little lazy we just say that's 150 milligrams per
12 kilogram and we leave out the dry soil part.

13 But that's why in Method 300.0 for solids
14 in Table 1 we can go from an intermediate reading
15 that the instrument gives us of milligrams per liter
16 and convert that to milligrams per kilogram of dry
17 material, because again, going back to the very
18 beginning, we know how much oven-dried soil we
19 started with.

20 Q. Right. And the reason you can't do this
21 method for the other is because you didn't start out
22 with dry soil?

23 A. That's right.

24 Q. But that's not exactly my question.

25 A. Okay.

1 Q. But I appreciate that explanation. My
2 question is, in this earlier methodology at some
3 point it was in milligrams per liter.

4 A. Correct.

5 Q. So if we are trying to compare, if the
6 mission is to compare apples to apples and for some
7 reason the Commission would like to see all the
8 numbers in the same format, what would be wrong with
9 using the per liter number that you would normally
10 get out of the testing process in order to compare
11 the tables and make them equivalent -- and I'm sure
12 there may be a problem with this. It just occurred
13 to me as you were saying this that we have been
14 focusing on trying to make it into kilograms. Is
15 there an equivalent problem in taking this first
16 testing and changing it into liters so the
17 Commission could have apples to apples?

18 A. It violates standard laboratory procedures
19 for soil testing, and that would be my primary
20 objection to that. And then because different
21 extraction processes are used, the numbers still
22 aren't going to be apples to apples. You are still
23 going to be apples to oranges because in one case
24 you used reagent water and another case you used a
25 strong acid. Even though there's an intermediate

1 step of milligrams per kilogram there, it's not an
2 equal comparison of the methods to one another
3 because the extraction material, the extractant is
4 different, water versus acid, so you are not going
5 to have the same piece of information. You are not
6 going to be able to interpret those correctly.
7 Again, the other point is it violates the standard
8 soil testing laboratory procedures.

9 Q. So you answered that question and I
10 appreciate it. I have a couple more questions. As
11 I understand what your testimony is -- and I need to
12 summarize it and make sure I'm not lost. I can do
13 pictures in the air which the record won't reflect
14 but we have pit contents and then the surrounding
15 ground around it, correct?

16 A. Uh-huh.

17 Q. And what you say is the correct test for
18 the pit contents is a mobility test and the correct
19 test for the surrounding contents is a concentration
20 test. Am I summarizing that correctly?

21 A. Yes, those are the methods that are
22 proposed.

23 Q. And there are some assumptions that you
24 revealed on cross-examination that I just want to
25 make sure I understand. One of those assumptions is

1 there's a separation between the pit content and the
2 soil which leads to the continuing differentiation
3 between pit contents and soil, and that makes you
4 comfortable with the different testing
5 methodologies?

6 A. Yes.

7 Q. Is that fair to say?

8 A. That's fair to say.

9 Q. So just for the hypothetical of it, if we
10 wanted to know the concentrations of the materials
11 inside the pit for health or safety reasons or maybe
12 we wanted to know what the failsafe position was if
13 there was no liner and things fell apart, as
14 regulators that might be an interesting question.
15 Does that make sense?

16 A. Yes.

17 Q. And if that's what is wanted by the
18 Commission, is there a scientifically defensible
19 method of telling us what the concentration of
20 chlorides is in the pit contents? Is there a test
21 that we would order and have people do in order to
22 get equivalent numbers for the purpose of
23 establishing numerical values that we could be
24 comfortable with as a society?

25 A. So let me break that into two pieces.

1 Q. That's fair.

2 A. The first question, is there a method that
3 you could use to determine the concentration of
4 chlorides in the pit waste. And the answer is yes,
5 300.0 would readily give you the concentration of
6 chlorides in the pit wastes.

7 Now, the second part of that, which I
8 think is the more important part, you're still not
9 comparing apples to apples if you look at the
10 concentration of pit wastes, of chlorides in pit
11 wastes to the concentration of chlorides in soil
12 materials, in the soil surrounding that. Yes, the
13 number is an apples to apples comparison because you
14 have used the same method, used the same procedure,
15 so you get a number. But the interpretation of that
16 number is what becomes problematic.

17 What is the number of chlorides
18 concentration in that pit that is the target? To my
19 knowledge -- I didn't sit through all the hearings
20 and procedures so I don't know -- but to my
21 knowledge, none of the materials presented to the
22 Commission addressed and used the absolute
23 concentration of chlorides in the pit.

24 Now, the other point -- again, your
25 assumption is what if it all fell apart. Is that

1 correct? If the pit liner failed?

2 Q. From a regulatory point of view you might
3 want to take the worst case scenario when you set
4 your standards and your regulations. You might want
5 to not have the assumptions that it's all
6 functioning.

7 A. In answering that worst case scenario, the
8 Method SPLP is a worst case scenario in terms of the
9 amount or the potential of mobility for salts to
10 move, for chloride to use. Because it uses a strong
11 acid which dissolves more chlorides than would be
12 dissolved in water, and so it shows you what
13 essentially again the maximum potential mobility of
14 chlorides in those pit contents are. If you use
15 300.0 and just the concentration of the absolute
16 concentration of the pit contents, you wouldn't get
17 the same reading. So to understand mobility and the
18 worst case scenario, use an acid leachate, and
19 that's what 1312 does.

20 Q. Okay. In terms of setting the correct
21 levels, the correct numbers, why wouldn't the
22 concentration of chlorides in the pit waste be of
23 interest to a regulatory body?

24 A. Well, I'm not a regulatory body
25 personally, and I think the regulatory bodies have

1 been relying on other regulatory agencies like the
2 EPA to define for them what are the issues of.
3 Concern. How should we approach these issues? And
4 in so doing have relied on the EPA methodologies
5 that they have defined as those that the regulatory
6 agencies would choose to set their limits.

7 The EPA methods for this case have been --
8 and Dr. Neeper identified that there's some concern
9 for chloride's mobility and so with mobility the
10 concern is water, and so EPA water quality methods
11 are those that are used and defined for setting
12 these limits, and so I think it's the fact that
13 regulatory agencies depend on other regulatory
14 agencies that define what are the limits that we
15 want to use for concern? What are the methods that
16 we want to use to define those limits.

17 Again, my understanding is there's a
18 fairly large body of research that uses the output
19 of Method 1312 in looking at the potential effects
20 on water quality, and that same body of research
21 does not exist, my understanding, for just the
22 absolute value of the concentration.

23 Q. But if you had to, could you give the
24 Commission approximate numbers in kilograms for what
25 the current standards are in Table 2? Could you do

1 that translation? And it goes back to the margin of
2 error question that you did answer once before but
3 I'm going to ask it in a more general term. What
4 would be your comfort level with making that
5 translation?

6 A. Not today I could not. I don't have any
7 comfort level in trying to give you a number or a
8 translation today.

9 Q. But it could be done?

10 A. Limits could conceivably be determined,
11 but there would be a need for a whole lot more data,
12 as you like. There would be a need for a great deal
13 more data to be collected to interpret those,
14 because at this point we don't know what the
15 absolute concentration of the pits are. All the
16 data that the Commission has collected to date that
17 the producers have had to file does not report the
18 absolute concentration of the pit contents. The dry
19 weights, because of the methodology that's been
20 recommended, the dry weights are not there to be
21 able to translate those no into mass units,
22 milligrams per kilogram.

23 So there are many variables that would
24 have to be answered, many questions that have to be
25 asked, in order to approach changing the units for

1 chlorides in Table 2 to mass units to reflect a
2 consistent unit of measurement all the way across.

3 Q. I still have a couple more questions. So
4 I understand Table 2 to have a set measurement in
5 liters, milligrams per liter?

6 A. Correct.

7 Q. And above that you have to take the
8 contents out and below that you get to keep them
9 there.

10 A. Right.

11 Q. What I'm saying is if you just take that
12 number and translated it into kilograms -- you
13 explained that you didn't like the 20 times. Just
14 that number, not the data out there and everything
15 else, but just that number, and then you assign to
16 it what I am assuming will be some margin of error,
17 and I'm guessing that that's where you may need the
18 data in order to determine your margin of error; am
19 I correct?

20 A. That really cannot be done on a general
21 basis. Because of the variability that exists, you
22 really need site-specific data, and having not seen
23 the site-specific data on these -- again, what's in
24 those pits? Well, there's a variety of things in
25 those pits, and the characteristics are dramatically

1 different. Even when you are stabilizing and mixing
2 it with three to one native soil, well, the soils in
3 the northwest aren't necessarily like the soils in
4 the southeast. And even the soils in one part of
5 the northwest might not be like the soils two miles
6 away.

7 So the site-specific nature of these data
8 are such that without a good bit more site-specific
9 data I couldn't even assign a reasonable estimate of
10 a margin of error. If I did, I would be guilty of
11 things that I would have flunked my students for in
12 my stats class. So I can't make those kinds of
13 things without some data to support it and to give
14 me a foundation for that kind of a conversion.

15 Q. Do you find it somewhat ironic that you
16 are reluctant to convert numbers without
17 site-specific data and yet the entire hearing is
18 about setting numbers without that same
19 site-specific data?

20 A. You are asking for a number conversion for
21 a specific table that has a specific method already
22 done or a suite of methods that are already defined,
23 and the suite of those methods that are defined have
24 readily available numbers, readily available
25 standard lab procedure outputs. And what you are

1 asking me to do is to introduce a lot of unknowns
2 and try to take that number that is standardized
3 according to lab procedures and divine some sort of
4 a conversion and I don't find it -- I'm a soil
5 science, so I don't find that at all incongruous
6 that I am unwilling to give you a conversion because
7 I understand what's in soil, I understand how soil
8 works and I understand how these methods work.

9 And, you know, there's a point where when
10 you look at something you say this is not equal to
11 this. I can't get from here to here. And with the
12 data provided in Method 1312, because of the way it
13 works, you can't get from Point A to Point B. The
14 data is not available. And trying to divine some
15 sort of conversion without understanding all the
16 variability that exists out there and all the
17 unknowns, my professional opinion is that's
18 misguided because it violates standard laboratory
19 procedures, it violates some of the things again
20 that as a professor I would have said, "This doesn't
21 work" to my grad students working on a thesis, "You
22 can't do this." And so it violates standard lab
23 procedures and violates some of the basic principles
24 of science that go into this foundation for the
25 methods and how the methods work.

1 Q. So you testified about the methods and
2 that they work and they have been used and other
3 regulatory agencies used these methods, and I think
4 it's fair to ask then or reveal my incredible
5 stupidity because I do not know the answer. The
6 number that is currently set for milligrams per
7 liter, is that a number replicated in other
8 regulatory agencies? Is that a number -- where does
9 the number come from, if you know?

10 A. I do not know the source of that number
11 and I have not reviewed -- I could tell you maybe
12 what the acceptable chloride contents are in
13 drinking water but that really is not relevant to
14 pit contents. So I do not know the source of that
15 number.

16 Q. So let me be clear. When you say we may
17 rely on all this methodology and the history of this
18 test, that does not necessarily refer to the actual
19 number that's been proposed in the data?

20 A. That is correct. However, if you changed
21 the method you still wouldn't have the ability to
22 interpret the number.

23 Q. You answered my questions. I appreciate
24 it. Thank you, Madam Chair.

25 CHAIRPERSON BAILEY: Mr. Fort? Do you

1 have questions?

2 MR. FORT: No, ma'am.

3 CHAIRPERSON BAILEY: Dr. Bartlit? Do you
4 have questions?

5 DR. BARTLIT: No, ma'am.

6 CHAIRPERSON BAILEY: Mr. Bruce? Is he
7 here?

8 MR. SMITH: Just to make it clear, you
9 offered the opportunity to cross to Mr. Fort, and I
10 think he has already said he didn't file a notice
11 with the Commission and I think that would foreclose
12 him from the opportunity to cross-examine.

13 CHAIRPERSON BAILEY: Okay. Then it's time
14 for the commissioners to ask their questions.
15 Commissioner Balch?

16 DR. BALCH: Good afternoon, Dr. Robinson.

17 THE WITNESS: Good afternoon.

18 DR. BALCH: If I may say, Clay is an
19 appropriate first name for a soil scientist.

20 THE WITNESS: Some have noted my alter ego
21 is Dr. Dirt and my license plate on my plate is Dr.
22 Dirt. You can go doctordirt.org and find fun
23 activities with soil for your kids.

24 DR. BALCH: I will keep that in mind. I'm
25 going to probably be asking you the same question,

1. although most of them will be asked so that I can
2. then ask my follow-ups so you will have to be
3. patient with that.

4. THE WITNESS: Okay.

5. DR. BALCH: Also I have a background in
6. physics, so I apologize, I am the one who
7. recommended we move to one table because I wanted to
8. lump everything into one single homogeneous mass.

9. The reason for that confusion perhaps is
10. the mixing. You close the pit, you mix it three to
11. one with soil. That could be native or it could
12. have come somewhere else. You don't know where.
13. You mix it with the dry pit contents so you don't
14. really have free liquids when you are doing the
15. mixing, or you shouldn't anyway. It's supposed to
16. pass the paint filter test before you mix the up to
17. three to one soil in with it. So to my mind, I'm
18. thinking that's essentially a soil with some
19. contamination in it.

20. THE WITNESS: Okay.

21. DR. BALCH: That was the motivation for
22. trying to simplify the tables down to one and have a
23. similar standard for a contaminant that's free on
24. the surface of the soil versus a contaminant that's
25. mixed in with what I presume to be a soil as well.

1 So I think from your direct and cross-examination
2 you are saying that pit contents mixed with soil is
3 not really soil.

4 THE WITNESS: They certainly would share
5 some similar characteristics, physical
6 characteristics. The chemical characteristics are
7 going to be much different because of the nature of
8 the pit contents, and even some of the physical
9 characteristics may be much different because of the
10 nature of the drilling fluids used.

11 DR. BALCH: So what we are interested in
12 here, and the models and other testimony that was
13 given before were primarily due to transport by
14 infiltration. So you have some fluid landing on the
15 surface of the area above the waste or the pit.
16 That water would percolate down, pick up salts and
17 transport them down towards a water table or
18 something like that. So the concern that we really
19 had is not necessarily with the pit contents, I
20 think you correctly stated, but with what comes out
21 the bottom of the pit contents.

22 I believe you answered Mr. Dangler's
23 question by saying that you could not specify a
24 ratio of salt in a pit waste versus what comes out
25 of the infiltration.

1 THE WITNESS: I think that's a correct
2 understanding of what I said.

3 DR. BALCH: And further, and I'm trying to
4 clarify this in my head, the acid used in the 1312
5 testing would give you a worst case scenario. That
6 would be the maximum amount of chloride that could
7 leach out of the material given an amount of water
8 falling through.

9 THE WITNESS: That's correct. It would be
10 more than water could leach out.

11 DR. BALCH: Do you have a feel for how
12 much more? Just in a generic sense, general soil?

13 THE WITNESS: Soils in this area -- so I
14 will do it regionally. Semiarid and all the state
15 of New Mexico is either semiarid or arid in terms of
16 soil characterizations and classifications. Most of
17 the state is a desert, right? That's not true with
18 some of the mountains. Some of the mountains are
19 not semiarid and arid. That's why you have nice
20 trees growing up there.

21 So these soils in arid and semiarid
22 regions are alkalin, and many of them are
23 calcareous. The pH is high and they have a lot of
24 calcium carbon compounds like caliche or gypsum in
25 them. Calcium is a strong cation. Chloride is an

1 anion. When you put them in the room together they
2 like to play with each other and hold on to each
3 other pretty strongly, a little more strongly than
4 water can generally dissolve. Sodium chloride is
5 very soluble and moves readily. Calcium chloride is
6 not as soluble; it does not move as readily.

7 Now, if you have mixed your pit contents
8 with native soils or even sub soils that have this
9 high amount of calcium, the calcium and the chloride
10 form some precipitants, they form some salts that
11 are sparingly soluble. They are soluble but they're
12 not highly soluble. You mix it in water, some of
13 those will come off but not all of them. You add
14 the acid extractant, all of those guys split up.
15 And there are other cations that are present that
16 would match up with the chlorides as well. You mix
17 it with water and not all of those come apart. You
18 mix it with a strong acid, all the of those come
19 out.

20 So again, there's so many different
21 varieties of soils. If you have a sand, that's not
22 going to be a big difference because sand doesn't
23 have a buffering capacity to hold much of the
24 calcium or the chloride. You mix it with a native
25 soil that has a lot of clay in it or caliche and the

1 number skyrockets. So it could be about the same if
2 you are dealing with something that's pretty sandy
3 to several -- a few orders of magnitude if you are
4 dealing with that clay. Because if you just run
5 water through that, it's got a high calcium
6 carbonate; caliche with clays, you don't get a whole
7 lot chlorides coming out the bottom because the
8 calcium his holding on to it. You mix that stuff
9 with a strong acid, all of that dissolves.

10 And we have some soils in this area that
11 would have 50,000 parts per million calcium. So you
12 match that up, that will hold on to approximately
13 50,000 parts per million chlorides, one-to-one
14 roughly -- not exactly, because -- pretty close.
15 Calcium is 40 and chloride is 35, so approximately
16 one-to-one.

17 So you run water, reagent water through
18 that, you don't get a lot of chloride coming out the
19 bottom. You put it in a strong acid, all of that
20 comes out essentially. So you could have again
21 several orders of magnitude difference in the amount
22 of chloride that comes out the bottom using water or
23 using acid.

24 DR. BALCH: All right. So perhaps if you
25 would be willing to say conservative to what level?

1 Just use a descriptive adjective and not give a
2 number to it? Slightly? Very? Somewhat?
3 Conservative as far as the estimate of mobile
4 chloride using the acid test in typical New Mexico
5 soil with pit contents mixed in.

6 THE WITNESS: If you use the acid test,
7 1312, it is an extremely conservative test because
8 it dramatically overestimates the amount of chloride
9 that's going to be available to leach under
10 rainfall.

11 DR. BALCH: Now, clay, I believe that most
12 of the pit waste that would be buried is going to be
13 non-hydrocarbon drilling fluid because there's
14 hydrocarbon limits to what can be buried. That's
15 going to most likely have at least some component of
16 bentonite clays added to it, so I'm very curious
17 about the same kind of discussion we just made about
18 the native soils in regards to a clay-rich mixed
19 contaminant and soil material.

20 THE WITNESS: Go back to this idea. Those
21 clays that are used in drilling muds have a
22 tremendous amount of surface area, both external and
23 internal because you can have access to those layers
24 of the clay in between those. So again, as a frame
25 of reference, if you took 100 grams, that's about a

1 little less than a quarter of a pound of sand, and
2 you could take every one of those particles and lay
3 it out flat, it might have enough surface area to
4 cover about half of this desk, this table, because
5 sands are big particles. They don't have much space
6 on them.

7 If you took the silt, the next smallest
8 size particles, and you spread them out, laid them
9 out flat, 100 grams of silt, you might have enough
10 to cover roughly this room in terms of surface area.

11 If you take what would be kind of a
12 standard clay material, it might cover a basketball
13 court if you could take every one of those particles
14 and lay it out.

15 But if you take one of those drilling
16 muds, you are getting close to a football field of
17 surface area, and every bit of that surface area in
18 these kinds of clays is charged and it has the
19 ability to hold on to cations like calcium, like
20 potassium, like magnesium, and those guys are
21 charged. So it's a little bit like taking magnets
22 and sticking them together. This one holds on to
23 this one but then something else can get stuck out
24 here.

25 So you have a negatively charged clay

1 particle and a positively charged cation and a
2 negatively charged ion and you start building these
3 out. So a lot of the chloride can be held and
4 attached to those particles.

5 DR. BALCH: Free chloride? And if you
6 apply infiltrated water to that?

7 THE WITNESS: And I'm getting to that
8 point. So that determines, at least to a degree,
9 some of the solubility of these chlorides that are
10 present in that soil because some of them are not
11 going to be free when you add water because they are
12 adsorbed. They are being held too tightly for the
13 water to let go of them because of the electrical
14 double layer, the electrical charges that are in
15 place.

16 So some of those are not going to be
17 released when you add water because they are bound,
18 physically bound to the structure of the soil and
19 the cations that are present.

20 DR. BALCH: Which is why when you kiln-dry
21 clay you have to have much higher temperatures.

22 THE WITNESS: Yes. Again, you get kind of
23 the same thing though when you add distilled water
24 versus some of these -- versus the extractant, the
25 acid extractant. Distilled water, deionized water,

1 no anions or cations in it until you mix it with the
2 soil or the media. Your acid extractant is 60
3 percent sulfuric, 40 percent nitric acid. That
4 means you have sulphate, which is a very strong
5 anion, highly active, with two negative charges. If
6 I'm losing everybody else, I'm sorry.

7 DR. BALCH: I'm following you. That's all
8 that's important.

9 THE WITNESS: We are talking science here.
10 So nitrate is an anion, reactive, one negative
11 charge. When you put such a strong concentration of
12 anions together in the same place, they become the
13 bullies in the room and they kick all the chlorides
14 off that were being held to those cations and soil
15 particles. They kick them all off and they take
16 their place. So now those, the chlorides, are out
17 in the soil solution and they are going to leach.
18 Because the nitrates and the sulphates in the acid
19 material kicked them off the sides.

20 So in essence it's a similar result as to
21 what happened when you used that with the high
22 calcium carbonate soil. You will get again probably
23 a few orders of -- at least a multiples more
24 chloride that comes off with the acid and maybe as
25 much as ten times as much or more, and that's kind

1 of a ballpark, but you are going to get
2 significantly more chloride that comes off even of
3 those pit contents with drilling mud in them with
4 acid than you would with water.

5 So again, that 1312 becomes an extremely
6 conservative test because it vastly overestimates
7 the amount of chloride that's really going to move
8 in the solution.

9 DR. BALCH: So the chlorides that are in
10 the clay components of the mixed soil material are
11 largely immobile for water?

12 THE WITNESS: Many of them, yeah.
13 Chlorides are very seldom present or anions are very
14 seldom present in soil without cations to match up
15 with them. So it's the combination of the cations
16 held to the soil and the anions held to the cations
17 that causes them to become less mobile especially in
18 soil with a small amount of clay. Doesn't say they
19 are not mobile but less mobile with the drilling
20 muds than with the standard soil, if we use whatever
21 standard soil is.

22 DR. BALCH: All right. So going back to
23 what's coming out the bottom under a normal
24 infiltration or even a worst case infiltration
25 scenario, the 300.0 test, where they put, I think

1 you said 20 times or ten times the amount of
2 water --

3 THE WITNESS: Ten times.

4 DR. BALCH: -- through by weight, and
5 that's the sample that you're looking at and that's
6 considered to be a reasonable estimate of ultimate
7 maximum infiltration response?

8 THE WITNESS: No, that has nothing to do
9 actually with precipitation or characteristics.
10 That's just an extraction technique. And the
11 purpose of that ultimately is to make sure you have
12 enough stuff that comes out the bottom to be able to
13 run through your instrument and do the analysis.

14 DR. BALCH: So it's overkill?

15 THE WITNESS: It's overkill.

16 DR. BALCH: General curiosity. I looked
17 at density of soils but what's the mass of a liter
18 of soil?

19 THE WITNESS: We don't usually talk about
20 it in liters. The traditional units for defining
21 density of soil, it ranges depending on the texture
22 from about 1.1 grams per cubic centimeter, and
23 that's a dry soil. Soil scientists always talk
24 about dry stuff. Engineers will do other weird
25 stuff with that and make it wet because they want to

1 know how much it will weigh when they haul it away,
2 but soil scientists are concerned about that dry
3 weight so 1.1 up to a sand it might be about 1.6
4 grams per cubic centimeter or megagrams per cubic
5 meter and you have no idea what that means so let me
6 try to find one that's more appropriate.

7 If you have a cubic foot of soil, so
8 that's going to weigh 75 to about 100 pounds and
9 that's the dry bulk density of the soil. So if you
10 have a foot of soil, one foot by one foot by one
11 foot, somewhere between about 70 and 100 pounds is
12 approximately what that would weigh before you add
13 any water to it. In that same rough amount of soil,
14 probably depending on the soil, it will take two to
15 four inches of rainfall to get that amount of soil
16 from really dry to wet.

17 DR. BALCH: I think that answered my
18 question.

19 CHAIRPERSON BAILEY: Do you have many
20 more?

21 DR. BALCH: Just a couple more. I'm
22 pretty close here. I believe that you replied to
23 Mr. Jantz that you couldn't really use Method 300.0
24 for the mixed waste appropriately in a regulatory
25 sense. You would be violating laboratory standards

1 set by EPA.

2 THE WITNESS: The EPA laboratory standards
3 are about water quality. So if your interest is in
4 water quality, that's the process you would use. If
5 you wanted to know the absolute concentration, you
6 could use 300.0. But again, that's not as
7 conservative as the Method 1312 because 300.0 just
8 uses water so it's a less conservative method than
9 1312 is.

10 DR. BALCH: Let's say we have a worst case
11 scenario using 1312. We have one liter of 2500
12 milligrams per liter chloride water come out of the
13 bottom of the pit waste. What's the impact of that
14 on the soil? What kind of concentration will you
15 have?

16 THE WITNESS: How much?

17 DR. BALCH: 2500 milligrams per liter
18 which is the proposed limit in the regulation.

19 THE WITNESS: You have 2500 milligrams per
20 liter that comes out the bottom, what is the impact
21 on the soil?

22 DR. BALCH: You have a liter of that.
23 What's the impact of that on a kilogram of soil?
24 What's the concentration?

25 THE WITNESS: Hang on just a minute. I

1 have to think about my math for a moment.

2 DR. BALCH: We get to ask questions that
3 are harder than the lawyers.

4 THE WITNESS: That's okay. The impact on
5 one kilogram of soil is going to be -- on the
6 concentration of chloride in that one kilogram of
7 soil is fairly insignificant, right? Because you
8 have put 2500 milligrams per liter or 25,000
9 milligrams per liter in that one kilogram of soil
10 underneath the pit. But in reality, you are dealing
11 with a much larger volume of soil and that once you
12 get it there, if there's any liquid at all you will
13 have a little bit of dispersion, and so that effect
14 begins to be ameliorated a little bit as the
15 chlorides begin to move out a little bit in all
16 directions.

17 And I think the real issue there, though,
18 other than the effect on the one kilogram of soil is
19 a practical issue. If that one kilogram of soil
20 that's been affected by 25,000 milligrams per liter
21 is below a pit that's been removed and whatever, if
22 it was above that, it's been remediated and removed
23 and that's not an issue. So if you are just
24 underneath the limit, you've got 24,999, we can
25 leave it there. What do we do? We cover it with

1 four feet of material and put something on the top
2 to revegetate. Background level of the topsoil or
3 one foot.

4 Now you have something that's 25,000
5 milligrams per liter that's four feet below the
6 surface. It's not going to have any -- doesn't
7 really have any impact on plant growth because you
8 are planting the vegetation on something that's four
9 feet away. The number of times in the current
10 climate that we are going to have precipitation to
11 get enough water through the four feet of overburden
12 down to where the 25,000 milligrams per liter is and
13 cause it to move down in this current climate where
14 the soils spend nine months of their year almost air
15 dry, it's going to have very little environmental
16 impact when you cover it with four feet of material.

17 DR. BALCH: Let me phrase that just a
18 little bit differently. A lot of the direct
19 testimony in this case has had to do with the fate
20 of chlorides that get below the pit waste. So
21 there's various models or scientific interpretations
22 of what happens and how much comes out the bottom,
23 and then what comes out the bottom is then applied
24 to a couple of different modeling techniques to
25 demonstrate its transport. So we are maybe a little

1 less worried about upward movement than downward
2 movement.

3 So I think my better question might be how
4 many liters of the 2500 milligrams of fluid can fit
5 into that kilogram of the actual soil, real dirt,
6 not the mixed soil. So it's going to be a sub soil.

7 THE WITNESS: There are several components
8 to trying to answer that question, and a lot of
9 assumptions that would have to go in. I'm willing
10 to do the math. It will take a long time though.
11 But conceptually, let me try to address the
12 question.

13 Page 41, the tables. Say 20,000 is the
14 limit for a water table that's greater than 100 feet
15 from the surface. That's the limit I see in Table
16 1. That means between the bottom of the pit and the
17 surface of a water table there's approximately --
18 say 96 feet of material, right? We buried it and
19 put four feet on top of it. We will use the easy
20 thing, 100 feet.

21 There's 100 feet of soil material above
22 the water table. You have got a pit and that
23 material just below it, tested it -- that was
24 20,000, so say we will put it at 20,000 milligrams
25 per liter. If you have the water to drive it down,

1 and some of the models that I looked at made
2 assumptions that for this climate are not
3 appropriate, and I'm not here to testify about
4 models but I did look at some of them. Some of them
5 assume that water is going to move down so they
6 actually had the negative soil water contents in the
7 surface in order to allow enough water to fill the
8 model to make stuff go down.

9 So until we have the next ice age and this
10 is a tropical forest, we are not likely to see much
11 availability of water without preferential flow to
12 force anything down. And even if we have that, we
13 have 100 foot of material through which this 25,000
14 or 20,000 milligrams per liter chloride is going to
15 be dispersed, so the concentration is going to drop
16 as it goes down.

17 Then on top of that, the chemistry of the
18 soil. They have got calcium, potassium, magnesium
19 and sodium, so some of that chloride is going to
20 precipitate, and I don't know that any of the
21 models, at least the ones that I briefly reviewed,
22 addressed the chemistry of what happens in the soil
23 as those chlorides go down. Because some of them
24 are going to precipitate.

25 DR. BALCH: I am really more asking your

1 opinion as a soil scientist.

2 CHAIRPERSON BAILEY: Let's hear that after
3 a 15-minute break.

4 (Note: The hearing stood in recess at
5 2:51 to 3:00.)

6 CHAIRPERSON BAILEY: I believe
7 Commissioner Balch, you were questioning the
8 witness.

9 DR. BALCH: I was. I have to admit I got
10 a little carried away because I always like to
11 interrogate bright minds under oath.

12 THE WITNESS: Thank you. I will take that
13 as a compliment. I wanted to clarify something.

14 DR. BALCH: That's okay. Actually, I just
15 have two quick questions really. In your
16 estimation, 1312 is a very conservative way to
17 estimate the potential mobile chlorides and pit
18 contents?

19 THE WITNESS: It is.

20 DR. BALCH: Second question, and it eluded
21 me.

22 THE WITNESS: While you are thinking, I
23 think I misspoke because we were bounced between
24 Table 1 and Table 2. In Table 2 on Page 41 of the
25 NMOGA Exhibit 20 we have 2500 milligrams per liter

1 and that's what you were talking about coming out as
2 the limit. That would be 25 to 50 feet below a
3 trench or pit. I did the math for you just for a
4 moment so if you have that one cubic foot of soil
5 and you put 2500 milligrams per kilogram of chloride
6 in it, in that one cubic foot of soil when you
7 dispersed it, the concentration would only be 62
8 milligrams per kilogram.

9 DR. BALCH: My other question has to do
10 with the number of tables. In your opinion is there
11 any way to treat this as one table or are we really
12 stuck with the dual units systems? We can't make it
13 Table 1 that only deals with milligrams per liter in
14 chlorides and we can't make a Table 2 that deals
15 with milligrams per kilogram for chlorides.

16 THE WITNESS: That's correct. Given the
17 testing methods that are here and given the purposes
18 I think that the Commission has, and again, I'm
19 putting some motives on you, I don't think that you
20 can feasibly combine these tables. It seems to me
21 they have a different purpose and the Commission has
22 a different purpose.

23 DR. BALCH: So if you went to EPA and
24 said, "How do I test this material, which is a mixed
25 pit waste with soil," they would tell you to go to

1 1312?

2 THE WITNESS: If the concern is water
3 quality.

4 DR. BALCH: Thank you. That's all my
5 questions.

6 COMMISSIONER BLOOM: Good afternoon. Just
7 in terms of background, having a standard expressed
8 as milligrams per liter, what does that tell us
9 about -- are you saying that's mobility? What more
10 do we know about mobility because it's expressed in
11 milligrams per liter?

12 THE WITNESS: Again, this is a leach test,
13 and that's the concept of a leach test is you are
14 pouring something in, in this case a strong acid,
15 and it's defining essentially the upwards bounds of
16 how much of the chloride in the pit contents could
17 be mobile under the worst circumstances.

18 COMMISSIONER BLOOM: Okay. I think that's
19 my last question. I was really interested in why we
20 needed a separate test but Dr. Balch went into that
21 with some degree of depth, so thank you.

22 CHAIRPERSON BAILEY: I have a couple of
23 questions. On Page 34 of NMOGA Exhibit No. 20, the
24 reference was made to the use of Method EPA SW-846
25 Method 1312. That was brought out or other EPA

1 leaching procedures. But I would like for you to go
2 to the page just before that that indicates that
3 that particular test had to do with the on-site
4 trench burial of waste. The Table 2 as presented on
5 Page 41 makes no distinction between on-site trench
6 burials and in-place burials, so if you'll go to
7 Page 32, as Ms. Gerholt pointed out, the third line
8 from the bottom, the analysis that was referenced
9 for in-place burials was 300.1. I would like to
10 hear one succinct answer as to why we should use the
11 leach system that's referenced in the trench burials
12 as opposed to the 300 method that's referenced in
13 the in-site in-place burials.

14 THE WITNESS: I'll try to be succinct in
15 two parts. The reference on Page 32 to Method
16 300.1, that is not the correct method to use.

17 CHAIRPERSON BAILEY: I understand that.

18 THE WITNESS: So that is inappropriate.

19 CHAIRPERSON BAILEY: But the appropriate
20 one is 300.0, correct?

21 THE WITNESS: Yes, 300.0 would work. Now,
22 let me also call your attention to the follow-ups,
23 and I'm not addressing limits for the sake of limits
24 but to note that in those two different methods that
25 were proposed for in-place burial and for trench

1 burial, when they use different methods they also
2 used different limits, and the limit with the 1312
3 which is a more conservative method, they showed a
4 higher chloride limit because again, it understands
5 that the acid is going to dissolve more of the
6 chloride.

7 It's the Commission's responsibility, as I
8 understand it, to decide whether you have one or two
9 tables. As long as you have a different purpose for
10 those tables it's my professional opinion that you
11 need two, because they have a different purpose and
12 you are measuring different materials. That's about
13 as succinct as I can get.

14 CHAIRPERSON BAILEY: We have heard quite a
15 bit about EPA SW-846 followed by Method 1312 which
16 is SPLP. There was a touch of 8015M and 8021B but
17 are there other methods -- is there an alternative
18 to what you have presented today for measurement of
19 chlorides that would give us a the milligrams per
20 kilogram?

21 THE WITNESS: Certainly there are. Again,
22 if the Commission chose, 300.0 could be used to
23 determine a unit in milligrams per kilogram of
24 chlorides. It is a less conservative approach, and
25 again, the leaching models that the Commission has

1 seen, they were using -- they are based on those
2 worst case scenario in Method 1312 SPLP. Their
3 laboratories have a variety of methods that could be
4 used to determine chlorides and report the results
5 in milligrams per kilogram, so that's the simple
6 answer to that because methods are just extraction
7 and analysis. So yes, there are methods that would
8 do an extraction, do the analysis and present a
9 result of chloride in milligrams per kilogram.

10 If the Commission's intent is to have the
11 most conservative approach, then those standard --
12 the Method 1312 is more appropriate and it has --
13 you know, it gives milligrams per liter. But I've
14 got a methods book over there that has several
15 alternative methods for determining chlorides.

16 CHAIRPERSON BAILEY: Yes, because we have
17 been given a limited number and I'm curious if there
18 aren't other appropriate methods out there in the
19 universe.

20 THE WITNESS: And essentially, all those
21 methods use a similar process if they are just
22 measuring content of chlorides. They are going to
23 use either reagent water or a weak -- some sort of a
24 weak salt solution to get the chloride out and then
25 I'm thinking maybe a sodium acetate or something, so

1 there would be some sort of a weak extractant that
2 they would use to get the chlorides out and measure
3 them using some sort of a technique like the IC, the
4 ion chromatography, but there are a myriad of things
5 that can detect what's there once you get it into a
6 filtrate.

7 CHAIRPERSON BAILEY: Pull out your
8 calculator. I like to work backwards.

9 THE WITNESS: Okay.

10 CHAIRPERSON BAILEY: We are given this
11 2500 milligrams per liter for a limit on chloride
12 where the depth to unconfined groundwater is less
13 than 10,000 milligrams per liter TDS.

14 THE WITNESS: Right.

15 CHAIRPERSON BAILEY: The 2500 is a product
16 of analysis by SW-846 and Method 1312?

17 THE WITNESS: Correct.

18 CHAIRPERSON BAILEY: Both of which have
19 dilution factors?

20 THE WITNESS: With Method 300.0 after 1312
21 there's no further dilution.

22 CHAIRPERSON BAILEY: Even though the SPLP
23 analysis --

24 THE WITNESS: The dilution is in the SPLP.
25 There's no further dilution when you take the

1 extract from SPLP 1312 and put it into 300.0. It
2 does not do another dilution.

3 CHAIRPERSON BAILEY: So according to SPLP
4 we have a 20 times dilution?

5 THE WITNESS: Twenty to one amount of acid
6 extractant to solid phase.

7 CHAIRPERSON BAILEY: So working backwards,
8 if we have a 20 times dilution and we arrive at
9 2500, then we are starting off with 50,000
10 milligrams per liter?

11 THE WITNESS: In what is defined there --
12 and yes, that math is correct. Interpreting that,
13 even within the context of Method 1312 is sometimes
14 a little fuzzy, but yes. That's correct.

15 CHAIRPERSON BAILEY: So given 50,000
16 milligrams per liter, that's a result of mixing
17 three to one of the soil and waste materials, so
18 that would actually be 200,000 prior to
19 stabilization with soils and dilution during the
20 extraction analysis.

21 THE WITNESS: Potentially.

22 CHAIRPERSON BAILEY: Okay. Just so I
23 understand.

24 THE WITNESS: Because what you are dealing
25 with are the contents of a pit and the drilling

1 materials that are coming out of that pit.

2 CHAIRPERSON BAILEY: 200,000 milligrams
3 per liter at 25 to 50 feet below the trench is
4 what's recommended there.

5 THE WITNESS: But that's not how you are
6 leaving the material.

7 CHAIRPERSON BAILEY: No, but that's what
8 the original --

9 THE WITNESS: That might be what's in the
10 pit before you mix it with the three to one ratio to
11 dilute it and change the amount -- the relative
12 amount there by adding more soil materials to it.

13 CHAIRPERSON BAILEY: Then I would like
14 your help in interpreting something. NMOGA's
15 Exhibit 20 has a definition of low chloride fluids
16 on Page 2 of Exhibit 20. And the definition reads,
17 "Low chloride fluids means fluids that contain less
18 than 15,000 milligrams per liter of chlorides
19 determined by analysis or process knowledge."
20 Without knowing what method is used for analysis to
21 arrive at 15,000 milligrams per liter, that could
22 originally be a much different number. Is that your
23 interpretation?

24 THE WITNESS: Well, you're looking at
25 whatever that section is, 19.15.17.7I. The key is

1 there low chloride fluids. The things that you have
2 been talking about in the pit and the dilutions and
3 the mixing soil, those are not fluids. If you start
4 with a fluid you can run that fluid directly through
5 a 300.0 and you get an answer without any kind of
6 dilutions.

7 Now, the other standard lab practice with
8 things is if I've got too much, my solution is too
9 hot. My instrument can't read it. I dilute it,
10 yes, until I can read it, but I keep track of all
11 the dilutions. When I'm done, I back-calculate to
12 present the result relative to the original volume
13 that I had.

14 So the only place that that seems to --
15 you know, the Method 1312 is the one where it's a
16 little fuzzy. But in this case where it says low
17 chloride fluids, any lab result that you get on the
18 fluid that you submit to them, the result is going
19 to be reported relative to the original volume so
20 they are not going to dilute it two times and say,
21 oh, well -- if you start with 20,000 and they dilute
22 it twice and they say well, you've only got 5,000
23 milligrams per liter. They are not going to do
24 that. They are going to go back to the original
25 volume.

1 So that result is not going to be
2 dependent -- in low chloride fluids, that is not
3 dependent upon the method because the laboratory
4 standards require them to report that in the
5 appropriate units relative to, in something like
6 this, the original volume that you got. A lab that
7 didn't do that would be in danger of losing their
8 certification.

9 CHAIRPERSON BAILEY: I just needed your
10 opinion on this so it would be clear on the record
11 that this did not require an analysis method.

12 THE WITNESS: If you wanted to define an
13 analysis method, 300.0 or other approved would be
14 appropriate.

15 CHAIRPERSON BAILEY: Those are all the
16 questions I have. Do you have redirect?

17 MR. FELDEWERT: Just a few points.

18 REDIRECT EXAMINATION

19 BY MR. FELDEWERT

20 Q. Would you go to -- you and Dr. Neeper had
21 a discussion and I think it was on Page 3 of
22 Dr. Neeper's Exhibit 6. I think he invited you to
23 explain the error of the 20 to one ratio that you
24 described as shown on this exhibit, correct?

25 A. Yes.

1 Q. I think Mr. Dangler had a similar question
2 in that he was trying to get to some kind of a ratio
3 of milligrams per kilogram as compared to milligrams
4 per liter. Now, if I understood you correctly, or
5 let me ask you, is the error really in trying to do
6 a ratio of this nature? I mean, are there just
7 simply too many variables to do this kind of a ratio
8 with any certainty?

9 A. The amount of uncertainty in the physical
10 properties of the solid waste when it has not been
11 dried and you don't know the nature of those
12 physical characteristics is what creates all the
13 uncertainty, and it's why I, as a practicing soil
14 scientist, would not have any confidence or desire
15 to try to give you a conversion factor to go from
16 milligrams per liter to milligrams per kilogram.

17 Q. By the same token, neither would a lab,
18 correct?

19 A. Neither would a lab.

20 Q. I'm looking at Page 41, NMOGA's Exhibit
21 20. And there has been not with you, but by others,
22 extensive testimony in prior hearings on the effects
23 of the proposed limits on the environment and public
24 health and safety. My question to you is, if we
25 begin to change -- given the EPA testing methods

1 that were identified in association with these
2 numbers when they were proposed and discussed, if we
3 start to try to change those levels with some
4 hypothetical conversions, milligrams per liter to
5 milligrams per kilogram, would you be concerned that
6 we would be getting away from the testimony that
7 supported these limits in the tables?

8 A. I would, because my understanding,
9 particularly for Table 2, is that the chloride --
10 testimony associated with chlorides and leaching has
11 used milligrams per liter, so moving away from that
12 would be moving away from the testimony the
13 Commission has heard.

14 Q. Now, you are aware, are you not,
15 Dr. Robinson, that when these tables were initially
16 proposed back in September of 2011 that the EPA
17 SW-846 Method 1312 was part of the method for that
18 table from the beginning, correct?

19 A. Correct.

20 Q. And it was contained within a footnote?

21 A. Yes.

22 Q. And what NMOGA has done is just taken that
23 footnote and put it directly into the Method column
24 to make it very clear that that applies?

25 A. Correct.

1 Q. And with respect to the SW-846 Method
2 1312, this is not a method that you came up with,
3 it's not a method that NMOGA came up with. This is
4 the EPA method?

5 A. Correct.

6 Q. And as we saw, for example, if we look at
7 Page 34 of NMOGA Exhibit 20 that Commissioner Bailey
8 took you to, when dealing under the current rule
9 with on-site trench burial and looking at
10 Subparagraph C, the Division itself under the
11 current rule couples for chlorides, EPA Method
12 SW-846 Method 1312 along with EPA Method 300.1,
13 correct?

14 A. Yes.

15 Q. And when you look at that page and do
16 that, the Division does it under the current rule,
17 the result is milligrams per liter, correct?

18 A. Correct.

19 Q. And we don't know why, but in other
20 aspects of the rule, for example, over on Page 33,
21 if you look at Subparagraph B on Page 33, you will
22 see for chlorides a measurement of simply milligrams
23 per kilogram, right?

24 A. Correct.

25 Q. Using EPA Method 300.1 but it's not

1 coupled with any kind of a leaching procedure like
2 SW-846 or Method 1312?

3 A. Correct.

4 Q. All right. So in essence what NMOGA has
5 done here is taken the testing methods that the
6 Division already acknowledges and accepted for these
7 types of waste, in particular the trench burial
8 being discussed in Table 2, and put them into the
9 tables, correct? This is not something they just
10 made up?

11 A. That's correct.

12 Q. And no one else has proposed any other
13 testing method for dealing with these wastes that
14 you are aware of?

15 A. Not that I'm aware of.

16 Q. And the only change that NMOGA has
17 proposed to the testing methods that are utilized in
18 the rule is to move from 300.1 to 300.0 and you
19 testified why.

20 A. Yes.

21 Q. That's all the questions I have. Thank
22 you?

23 CHAIRPERSON BAILEY: You may be excused.
24 Do you have any other witnesses?

25 MR. FELDEWERT: I do not. This is the

1 witness to address the subjects that we understood
2 would be at issue here today.

3 CHAIRPERSON BAILEY: Do you rest your
4 case?

5 MR. FELDEWERT: We do.

6 CHAIRPERSON BAILEY: Mr. Jantz, do you
7 have witnesses that can testify to the scope of what
8 is allowed?

9 MR. JANTZ: If it's okay with the
10 Commission, again, Dr. Neeper and I propose that
11 Dr. Neeper testify before OGAP.

12 CHAIRPERSON BAILEY: Dr. Neeper, you are
13 frowning.

14 DR. NEEPER: I might have heard you wrong.
15 I wasn't testifying for OGAP.

16 MR. JANTZ: Before.

17 CHAIRPERSON BAILEY: I had the same
18 problem that I didn't hear it correctly.

19 DR. DONALD NEEPER
20 after having been first duly sworn under oath,
21 was questioned and testified as follows:

22 DR. NEEPER: Madam Chairman, members of
23 the Commission, I am Donald Neeper. I am speaking
24 on behalf of New Mexico Citizens for Clean Air and
25 Water. A notarized certificate authorizing both

1 myself and Dr. Bartlit to speak on behalf of the
2 organization was filed as Exhibit 1 with the
3 prehearing statement for these combined cases.

4 Although I have been qualified in these
5 combined cases and in prior cases as an expert in
6 soil physics, I will review a portion of my
7 qualifications today because I did not previously
8 dwell on my experience that I think applies directly
9 to today's discussion. And the discussion really
10 focuses on the limits to certain contaminants that
11 may be abandoned on the soil or in burial units or
12 the methods for measuring those units. I will at
13 this point ask Dr. Bartlit to put at the back of the
14 room copies of the prehearing statement and the
15 attendant exhibits. They are in my briefcase in a
16 manila folder. I should have placed those prior to
17 testimony.

18 Exhibit 4 is a slightly revised
19 prehearing -- in the prehearing statement. What
20 changed from the original Exhibit 4 which was
21 already accepted into evidence is my E-mail address
22 and my two newest publications are listed by
23 citation to the journal rather than simply as having
24 been accepted for publication?

25 I regret the revised exhibit, I think, was

1 accidentally left out of the electronic copy, and I
2 apologize for that, but there are copies that should
3 be going to the back of the room which people may
4 have. Nothing has changed in that except my E-mail
5 address and the actual citation, publication
6 citation of my papers.

7 I have previously described my education
8 as a Ph.D. in thermal physics after which I
9 conducted post-doctoral research in liquid helium.
10 After coming to Los Alamos in 1968 I conducted
11 computer modeling of thermonuclear weapons and
12 modeling of solar buildings. In the late 1990s I
13 was interested in a particular mode of transport of
14 vapor contaminants in porous media, particularly in
15 the soil, and this led to my supervision of the
16 environmental investigation of four sites at Los
17 Alamos that contained buried wastes. The burial
18 units were shafts and pits as deep as 60 feet. One
19 or two units had been shallow ponds not unlike
20 temporary drilling pits. A major task of our team
21 was to assess the movement, if any, of the
22 contaminants. In that investigation we sampled
23 surface soils as well as drill cores and vapors from
24 as deep as a few hundred feet.

25 After official retirement in 1993 I spent

1 several years in consulting in that investigation
2 and similar investigations regarding contaminant
3 transport. About ten years ago I returned to Los
4 Alamos National Laboratories as a guest scientist
5 with a personal project of understanding the
6 measurements we had already made in the subsurface
7 movement of chemical vapors that are similar to
8 petroleum vapors.

9 Starting in 2001 I served three years on
10 the governing board of STRONGER, a nonprofit
11 organization funded by the EPA and by the American
12 Petroleum Institute to review the environmental
13 regulations of petroleum producing states. I also
14 turned my attention to New Mexico's regulatory
15 procedures. I remember participating in the 2003
16 pit hearing and subsequent work groups and other
17 hearings and in remediation proposals.

18 In preparation for the 2007 pit hearing I
19 privately conducted both surface sampling and
20 subsurface drilling of old pits. I initiated
21 computer simulation of chloride transport using the
22 FEHM, and that is its name, FEHM code of the
23 numerical hydrology group at Los Alamos. This code
24 is an ever-evolving research tool that simulates the
25 movement of water, gases and chemicals strictly in

1 soils. It was used in support of the Yucca Mountain
2 nuclear waste repository. It is used
3 internationally by some experts and it is available
4 to the public. But I would caution it should be
5 used only by experts who are in close contact with
6 the people who continually revise the code.

7 Although I worked out the equations that
8 could represent the effects of extremely large salt
9 concentrations, as the salt effects the vapor
10 pressure, the viscosity, the surface tension and the
11 pore water, I did not have the many months of time
12 that would have been required to implement these
13 extreme effects in the code, so my personal
14 calculations simulated much less extreme conditions.
15 However, last month a former colleague called me to
16 ask questions about the equations which he is now
17 implementing in the code as it is being applied to
18 subsurface sequestration of carbon dioxide
19 containing hot, saturated brines.

20 Why do I go through this? I am
21 establishing my relevance to today's kinds of
22 discussions. I have physically been in pits,
23 landfill pits, large enough and deep enough to
24 contain several houses, and I have been in or on oil
25 field pits as small as a couple thousand square

1 feet. I am offering this expanded description of my
2 experience because I realize my previous
3 presentations before this Commission may have been
4 too abbreviated. As one observer said, I tend to
5 present two concepts and leave out three missing
6 steps in between and I am trying not to do that
7 today.

8 I am offering my multiple experiences with
9 computer simulation of physical systems, my
10 experience in both simulating chloride transport,
11 scientifically vetted code and my experience with
12 various units that come up when you deal with waste
13 in the soils and the possible contaminants.

14 I know that to understand the impact of
15 specific regulations it is necessary to use
16 measurement units but to use them within the context
17 where under physical circumstances the rule is
18 applied. You have to know what the units mean. For
19 example, water in soil might be quantified as a
20 fraction of mass, grams per kilogram, or as a
21 fraction of porosity called saturation, or as a
22 moisture potential that drives movement, and each
23 expression presents a different view of the same
24 thing, which is water in the soil.

25 With that, I offer myself as an expert

1 qualified to evaluate the measurement and
2 characterization of contaminants in the soils and I
3 offer my updated resume which the Commission has as
4 NMCCA and W Exhibit 4 revised for the record of the
5 hearing.

6 CHAIRPERSON BAILEY: Any objections?

7 MR. FELDEWERT: Could I ask a few
8 questions?

9 CHAIRPERSON BAILEY: Sure.

10 VOIR DIRE EXAMINATION

11 BY MR. FELDEWERT

12 Q. Dr. Neeper, you qualify yourself as what?
13 I'm sorry, could you repeat that?

14 A. I will try to repeat the exact words used
15 here, which is hopefully in agreement with what was
16 previously occurred in this hearing. I offer myself
17 as an expert in soils physics qualified to evaluate
18 the measurement and characterization of contaminant
19 in the soils.

20 Q. Now, in terms of your experience with
21 measurement, have you ever utilized EPA Method
22 300.0?

23 A. I have probably specified, and you are now
24 asking me to remember back about 20 years, specified
25 which lab methods might be used, but in general

1 those specifications were issued by a higher
2 authority and operating lab-wide. In my own
3 investigation of chlorides in drilling-affected
4 soils I did my own measurement by a technique which
5 I could describe to you.

6 Q. That's all right.

7 A. Which I used the standard laboratory.

8 Q. But you weren't involved using EPA Method
9 300.0?

10 A. I did not myself operate the chromatograph
11 under Method 300.0 nor did I dilute samples exactly
12 as specified by 300.0.

13 Q. Have you ever taught -- would the same
14 hold true with respect to SW-846 Method 1312?

15 A. SW-846 I look on as sort of a catalog of
16 many methods, and the one you asked about is a
17 dilution procedure of 1312. It's frequently used.
18 I did not go about myself diluting the samples, the
19 many samples we had at Los Alamos.

20 Q. So you have never utilized yourself that
21 procedure?

22 A. I have not conducted that procedure.

23 Q. Have you ever taught about these
24 particular procedures?

25 A. Have I taught about them in class?

1 Q. Yes.

2 A. No, I have not taught classes on these
3 procedures.

4 Q. And you said to the extent that they were
5 required to be used, it was dictated by a higher
6 authority?

7 A. In most of the sampling of solids, at that
8 time in the environmental restoration, higher
9 authority established the chain of custody and the
10 laboratory testing methods that would be used.
11 There are exceptions to that, and one of those
12 exceptions might be with the vapor sampling, a good
13 part of which we developed ourselves.

14 Q. Are you intending to offer testimony today
15 on these particular EPA testing methods?

16 A. Let me think of what you mean by testimony
17 on the methods. I will certainly have testimony
18 related to the methods. I certainly will probably
19 use the term dilution. I may refer to the leach as
20 described by these methods.

21 Q. Okay. Are you going to be offering today
22 some other type of testing method for consideration
23 by the Commission?

24 A. Yes. If I have time to deviate from my
25 prepared testimony I would mention one other method,

1 but that would simply be in stating a convenient
2 method that might be available for an operator if he
3 were uncertain of his wastes and he wanted to take
4 care of them right away.

5 Q. But you have not proposed any
6 modifications to the testing methods that NMOGA has
7 submitted?

8 A. For that I need to -- I have not proposed
9 as yet a replacement for those methods. You may
10 find me supportive of some things already said
11 today. Back in my testimony there may be some
12 comments on the simplified field method, and so I
13 would need to review the record to see if indeed I
14 have offered that to the Commission but not as a
15 replacement for a laboratory test.

16 Q. You are aware if you were going off of
17 such modifications you were supposed to file them by
18 December 24th so we would all be aware of what you
19 were proposing, correct?

20 A. If I were proposing a replacement table
21 for the rule then I would have needed to have
22 submitted that ahead of time. If I'm going to
23 discuss the rule and try to provide enlightenment as
24 to its applications, I did not see a need to supply
25 that.

1 Q. I was talking specifically to the extent
2 that you had proposed use of some other type of
3 testing method. You are not going to do that here
4 today?

5 A. Not a testing method that has not already
6 been discussed today.

7 CHAIRPERSON BAILEY: At this point why not
8 go ahead and let Dr. Neeper testify and then you can
9 object at that point.

10 MR. FELDEWERT: Yes, ma'am. Thank you.

11 DR. NEEPER: I would offer then myself to
12 the Commission under the terms as I stated to be
13 qualified as an expert witness.

14 CHAIRPERSON BAILEY: Are there objections?

15 MS. FOSTER: For clarification, he is
16 qualified as an expert in soil physics again, which
17 I believe is what he was qualified in previously?

18 CHAIRPERSON BAILEY: Soil physics with --
19 you added something?

20 DR. NEEPER: I will make the statement
21 again. I offer myself as an expert in soil physics
22 qualified to evaluate the measurement and
23 characterization of contaminants in soils.

24 MR. FELDEWERT: No objection.

25 CHAIRPERSON BAILEY: We accept you as an

1 expert under those terms.

2 DR. NEEPER: For information, what I was
3 really doing is saying I have not worked in soils
4 mechanics.

5 I usually offer my testimony in a very
6 conversational manner, as the Commission is aware.
7 However, I notice that in some cases my
8 conversational words do not carry the intended
9 meaning when expressed in the written form in the
10 record, and that is no criticism of the scribe.
11 That is simply noting the difference between written
12 English and spoken English. Therefore, I may read
13 large portions of my testimony today because I need
14 to use exact words.

15 I realize that one purpose of this
16 reopened hearing is to establish a particular
17 clarity in the record, and I want the record to be
18 helpful to the Commission.

19 This is an extract copied from the
20 transcript of the November 15 meeting of the
21 Commission, and here I risk repeating what I think
22 Mr. Smith made, but to this I have accented some
23 words in red. The Commission has asked specifically
24 for units in milligrams per kilogram and for the
25 record to contain a method for converting units.

1 The revised table submitted by Industry appeared not
2 to respond to these requests. I offer the proposed
3 limits of milligrams per kilogram, and I will offer
4 some conversion arithmetic, although we have
5 testimony saying you can't have an exact conversion.
6 My conversion and my purpose for doing that is to
7 give clarity to the Commission and room for the
8 Commission to move and discuss the things they need
9 to discuss. I will also present other units with an
10 approximate conversion which may provide a greater
11 understanding of the table. And finally, I shall
12 present possibly erroneous text in the rule as it
13 may leads to conflicting interpretations of how
14 Table 2 is applied. This is not trying to alter the
15 rule, this is pointing out something that may be in
16 error of which the Commission might want to be
17 advised.

18 Conversion between the milligrams per
19 kilogram solid and milligrams per liter for liquid
20 in the EPA leach test. We have already heard
21 testimony that you cannot make such a conversion
22 exactly. However, in the Commission's desire to
23 express things in one table if they can, you have
24 some need to understand what are you dealing with.
25 Some of the questions today dealt with what size are

1 we dealing with? So I take an example of a kilogram
2 of solid waste and I say if it had 20 milligrams of
3 chloride, those would all, nearly all appear
4 somewhere in the leach and the liquid that comes out
5 of the 1312 test.

6 If you have a milligrams per liter in the
7 combined liquids that came out, all of that had to
8 come somewhere from the original waste, so you would
9 imply with about 20 liters that you would have about
10 20 milligrams per kilogram in the original waste.

11 What is the uncertainty in this? The
12 uncertainty is what was squeezed out in the pressure
13 test. The amount of the liquid squeezed out of most
14 of our wastes, I would suggest, would have to be
15 less than the total volume of the waste. And the
16 total volume of the waste as we heard as estimate of
17 density today was somewhere between 1.1 and 1.6
18 kilograms per liter of waste.

19 So very roughly we can say somewhere --
20 the chloride that was going to get removed from the
21 waste wound up in 20 liters of leach or possibly 21
22 total liters of liquid and a combined -- if the
23 combined concentration there were one milligram per
24 liter, that would indicate about 20 milligrams per
25 kilogram in the waste sample plus or minus one in

1 20. Could be off by about one in 20 or five
2 percent, but at least for understanding what you are
3 doing, you could multiply by 20 and have some idea
4 of where the numbers are taking you.

5 There are other units that appear in the
6 record, particularly when the effects of waste or
7 waste constituents on life forms were being
8 considered. One of those units that appears in
9 several parts of the testimony is the EC or
10 electrical conductivity units. However, no
11 conversion between EC and milligrams per kilogram
12 was offered in testimony. I am saying here there is
13 no exact conversion and you can find that statement
14 in the literature. In part, because a mixture of a
15 saturated paste of waste in soil which gives you EC
16 is a relative thing. Somebody may use one or more
17 drops of soil than somebody else does in making the
18 paste. The amount of water added to the paste is
19 inexact.

20 But as an approximation, to convert
21 milligrams per kilogram you can multiply the EC
22 value by about 169. I warn you that deviation from
23 this kind of linear approximation occurs above an EC
24 of 100 because of how the electrical conductivity of
25 salt water relatively decreases as you add salt to

1 it.

2 But I provide an example taken from the
3 transcript of the hearing that the EC limit of
4 alkali sacaton is 12. I multiply 12 by 169 and I
5 get something around 2,000 milligrams per kilogram.
6 This is an approximate conversion, as I have said.

7 You would be correct in asking where does
8 this come from and how do you justify it? And this
9 is where I think we run into possible objections. I
10 will try to show why or how this comes about, how
11 you can relate EC to milligrams per kilogram without
12 getting into life effects.

13 This is not new information. This is in
14 the record of the hearing, and I used it because it
15 was in the record, but it may be obscure. I am not
16 discussing damage to vegetation, I am using two
17 datasets to show how the conversion between EC and
18 milligrams per kilogram, which is the same as parts
19 per million. It may be done.

20 MS. FOSTER: I'm sorry, I have to object
21 to this line of statement made by Dr. Neeper at this
22 time. Again, we are here to discuss the tables that
23 are on Page 41 of NMOGA's exhibit. This
24 conversation about EC Dr. Neeper has already
25 testified to it during the hearing. It is not

1 directly relevant to the tables. There is no line
2 item here on the table concerning EC or lifelong
3 vegetation.

4 Again, Dr. Neeper could have added it if
5 he was proposing some sort of modifications to the
6 proposal submitted on November 29th by the
7 Independent Petroleum Association or NMOGA, so I
8 think we are kind of going down a rabbit hole on
9 this EC discussion.

10 (Note: A discussion was held off the
11 record).

12 MR. SMITH: What I have said to
13 commissioner Bailey is if this is -- if this
14 presents the same sort of problem to the Commission
15 that the Commission identified with the table, then
16 I think if the Commission wants to hear this, they
17 should. If it isn't the same sort of problem and
18 presents the same issue to the Commission, then I
19 would agree that it ought not be heard. That's
20 something the Commission is going to have to
21 determine.

22 CHAIRPERSON BAILEY: Commissioner Bloom,
23 do you think this is a question in your mind?

24 COMMISSIONER BLOOM: We are allowed to
25 proceed. I think today what we are looking at is

1 trying to define limits, contamination limits, and I
2 understand how that affects the environment and
3 human health, so I think it could be interesting. I
4 think it could be interesting.

5 MR. SMITH: Let me say, if I understand
6 correctly what you have just outlined, Commissioner,
7 I think that would fall outside the scope of the
8 Commission's clarification earlier today. If this
9 testimony is valuable to you for some sort of
10 conversion issue that you have, I think it's close
11 enough that you can allow it. But based on the sort
12 of interest that you have expressed, Commissioner
13 Bloom, I think that probably goes outside where you
14 are supposed to go today, which doesn't mean that
15 you cannot, if you decide you want to, reopen the
16 hearing for that purpose. It would simply require,
17 I think, further notice and more process.

18 COMMISSIONER BLOOM: I would say
19 converting the EC number to milligrams to kilograms
20 is getting us closer to understanding a little bit
21 more about some of the effects of the waste we might
22 find in pits.

23 MR. SMITH: So the conversion is your
24 interest in this testimony?

25 COMMISSIONER BLOOM: Yes.

1 MR. SMITH: Okay. Then I think that's
2 fine.

3 DR. BALCH: I'm kind of along the same
4 line. I think if EC is being presented as an
5 alternative to the milligrams per kilogram or
6 milligrams per liter then I think we should listen
7 to the testimony. Also, given that content, I would
8 like to see what Dr. Neeper has to say about the
9 appropriateness of having two separate tables. So
10 is that where you are kind of going with this? EC
11 is going to be an alternative or a possible
12 alternative?

13 DR. NEEPER: I am not telling the
14 Commission that they must adopt EC as a measurement
15 unit. That is in my direct testimony, any words I
16 have to that effect. What I am doing is offering a
17 conversion so that as the Commission goes back and
18 looks through the record they have a way of
19 understanding what does one unit mean in terms of
20 the other. And I am doing this specifically, as I
21 said this morning, because I attempted to, in
22 cross-examination, to bring this out of industry
23 witnesses and none of them would answer it. Had
24 they answered the question I would not be offering
25 it today.

1 Let me add one more thing. I am not
2 discussing damage to vegetation. I am using two
3 datasets to show the conversion between two sets of
4 units.

5 DR. BALCH: I think in the context of EC
6 as a potential alternative variable name or
7 definition, I would be okay with it. If we go too
8 far beyond that and bring out information already
9 available on direct, I can he we violate what we
10 tried to set the limit to the hearing for.

11 CHAIRPERSON BAILEY: Then the objection is
12 overruled but a caution is given to Dr. Neeper to
13 stay within the boundaries that have been
14 established for this hearing.

15 DR. NEEPER: I am trying my best, Madam
16 Chairman, and I understand. That is why I used
17 material already in the record, and the purpose is
18 to show the conversion for the use of the Commission
19 because it has been offered once before as a
20 potential limit in my earlier testimony.

21 EC is electrical conductivity, and I want
22 you to consider first only the blue points in that
23 dotted line. And they could be labeled with any
24 arbitrary names, A, B, C, D if you wish, but imagine
25 simply moving those points left to the vertical axis

1 until they are all lined up in the vertical axis.
2 You would have a set of points on the vertical axis
3 between zero and 1400 parts per million or 1400
4 milligrams per kilogram.

5 Likewise -- or excuse me, that is data
6 that comes from the Integrated Petroleum
7 Environmental Consortium at the University of Tulsa.
8 I can follow the data backward if you would like.
9 It's not mine. If you picture those same blue
10 circle points and simply move them straight
11 vertically downward to the horizontal axis, you have
12 a series of points going between zero and eight EC
13 units, and those represent EC units as expressed by
14 the U.S. Department of Agricultural for sodium
15 chloride. Now, these two datasets attach the same
16 name to each corresponding point. Those happen to
17 be names of grasses, but I don't care. They could
18 be A, B and C.

19 If you simply join the two datasets
20 plotting one against the other you get the dotted
21 line with the little blue circles. The red line is
22 nothing more than a fit to the blue line below an EC
23 of about five, and it is from that that one can say
24 that an EC can be multiplied by about 169, come up
25 very roughly with the parts per million. That's all

1 there is to it. It gives you a handle on the
2 question.

3 If there's any question where it came
4 from, I can give it in detail if it leads us astray.
5 This is Table 1 of NMOGA's revised proposal. I
6 notice they are based upon depth to groundwater.
7 The purpose of Rule 17 is protection of environment.
8 There's no other reason for it in the rule so I
9 emphasize that groundwater is part of the
10 environment, but that the environment also includes
11 more than groundwater. That is probably why we
12 consider having different concentrations for depth
13 and for surface. I can't rule on that, but I point
14 out the surface is an important part of the
15 environment.

16 This table applies to a five-point
17 composite sample, and when you are applying it to a
18 leak as it has been expressed in a pit or in a tank,
19 you should be aware that a five-point composite
20 sample may not represent what you would find if you
21 sampled only a wet spot or a stain spot. I marked
22 in green those items that have been changed. I
23 marked with red other things that could be of
24 interest to the Commission. NMOGA has changed EPA
25 300.1 to 300.0 in the table. I support that change.

1 It is entirely correct.

2 We have heard discussions of TPH. The
3 question I have with this is TPH is identified as
4 GRO plus DRO. That is not common in the literature.
5 The term TPH usually includes heavier oils that are
6 also given by the same test.

7 The proposed chloride limits I express
8 here in terms of milligrams per kilogram as an
9 intuitive unit or an approximate unit. I also
10 expressed them as sodium chloride because we often
11 use the term salt and that has appeared in this
12 testimony. These give you approximations with the
13 conversion, as I expressed it before. It also
14 establishes in the hearing the conversion from
15 chloride to sodium slide should the Commission ever
16 need to use that. Sodium chloride is chloride
17 multiplied by 1.648 for weight or mass.

18 Table 2 is the closure material for
19 buried mass. I have circled, drawn a box around the
20 revised areas in green and some items to note that I
21 circled in red. We have already heard the
22 discussion of the limits in milligrams per liter so
23 I don't need to do that. I have expressed in the
24 right-hand column the approximation. I have
25 expressed in terms of what you would get in the

1 solid waste as milligrams per kilogram.

2 I do not propose making a table such as I
3 have shown on the screen. I propose this for the
4 convenience of the Commission so in their
5 deliberations they are not constrained with a unit
6 that is unfamiliar or to which it is difficult to
7 relate.

8 I do note that IPANM proposes a slightly
9 different table. It proposed that in the lower
10 left-hand corner that the depth to groundwater be
11 greater than 50 but less than 100 feet, which would
12 leave no restriction if the depth to groundwater was
13 greater than 100 feet as I would read that little
14 part.

15 I likewise expressed the Table 2 limits in
16 intuitive units according to the conversion that I
17 already gave, the approximate conversion, in which
18 the chloride limit for depths less than 50 feet, for
19 example, comes out to approximately 50,000
20 milligrams per kilogram. I also expressed that in
21 terms of sodium chloride content because we often
22 talk about whether it is salt coming out of that
23 buried waste.

24 I thought it might be of use to the
25 Commission to have some idea of where the proposed

1 limits had come from. I have asked for this in
2 cross-examination and have not received answers, so
3 I propose it here.

4 MR. FELDEWERT: I object to this line of
5 questioning. I'm not sure -- I understood what he
6 was trying to do up to this point, but now we seem
7 to be getting into limits, and as he put it, he
8 wants to talk about where the limits come from. I
9 don't see how that relates to the issue that's
10 before the Commission today. To me that crosses the
11 line.

12 CHAIRPERSON BAILEY: Any response?

13 DR. NEEPER: My response is simply that
14 the origin of the limits has not been expressed.
15 The Industry has never expressed that in its
16 case-in-chief, and yet, it would seem to me if the
17 tables are up for discussion, some idea of what the
18 limits mean in terms of actual experience in the
19 field, in terms of things we have done and things we
20 have seen is appropriate. It would be beneficial to
21 the Commission's consideration. This is not
22 necessarily a proposal to change the limits but it's
23 an idea of how they might operate in the real world.

24 MR. FELDEWERT: I think I would respond
25 that that was one of the subjects that was

1 extensively addressed through the May through August
2 hearings when we were dealing with these limits.
3 Because as I understand from the slides, he wants to
4 take these limits and compare them to some study
5 that he did of pit contents at some point in time,
6 and that was all discussed during the hearing. Now
7 we're back here again and we want to do the
8 comparison again between the limits that are not at
9 issue here today and compare them to the contents of
10 the pit. So I don't see how that relates to the
11 conversion issue that you all wanted to have
12 addressed here today.

13 MR. SMITH: I think if you want to hear
14 this testimony you can hear it, but you have to, I
15 think, reopen the hearing on that with notice going
16 out. In terms of hearing it today in this hearing,
17 it sounds to me as though it has moved beyond the
18 scope of what you described in your notice and
19 clarified earlier today.

20 CHAIRPERSON BAILEY: I will have to agree
21 with our counsel, that this is outside of those
22 boundaries that were set by the notice and by the
23 order. If in the future we decide to reopen for
24 other topics, we can renote for that particular
25 topic.

1 DR. NEEPER: Very well. I would like to
2 respond, however, to the objection, if I may.

3 CHAIRPERSON BAILEY: Please.

4 DR. NEEPER: The objection, as I heard it,
5 indicated this would have something to do with my
6 pit sampling. It has nothing to do with my pit
7 sampling.

8 MR. SMITH: Let's just ask Dr. Neeper, is
9 the testimony that you propose to give with this
10 slide, does it arise from or relate to the
11 conversion issue that has been discussed thus far?
12 When I say that, I mean going from milligrams per
13 liter to milligrams per kilogram?

14 DR. NEEPER: No. It relates to if you had
15 milligrams per kilogram, what have you experienced
16 in the real world that corresponds to that? How do
17 our wastes as measured in the real world correspond
18 to the milligrams per kilogram or their equivalent
19 in milligrams per liter that may appear in the rule?

20 MR. SMITH: That sounds to me although
21 it's beyond what you wanted to hear.

22 CHAIRPERSON BAILEY: I'm afraid you will
23 need to limit yourself to what has been noticed and
24 was discussed as our boundaries for this opening of
25 the record.

1 DR. NEEPER: Very well. I will skip ahead
2 to the Page 12 and see if this fits within the
3 boundaries, because I am dealing with how the tables
4 are called or interacted with by the rest of the
5 rule, and this is not having to do with changing the
6 tables.

7 I will give some background. A temporary
8 pit may be off-site, according to the definition
9 given in 19.15.17Q, and we have heard other sections
10 of the rule cited today. The term off-site has been
11 deleted from the trench specifications in Paragraph
12 K of this. Therefore, neither temporary pits nor
13 trenches are necessarily located on-site. Let's
14 look at the implications.

15 The term on-site closure in 19.15.17.10C
16 implies that this paragraph applies only on-site,
17 which is undefined. Setbacks for trenches appear
18 only in Subparagraph 10C, too. Therefore, although
19 setbacks for pits appear elsewhere, no setbacks are
20 required for any trench regarded as off-site.

21 MR. FELDEWERT: Dr. Neeper, I want to
22 interrupt you just one minute here. I'm going to
23 object for the record because what he wants to talk
24 about is how the language of the rule impacts siting
25 requirements for trenches, which I don't see how

1 that's germane to the issues that you have
2 identified here today. More importantly, to the
3 extent that this is indeed an issue, number one,
4 it's something that he could have addressed by way
5 of some other type of proposed modification to the
6 language, which was not done.

7 I don't know, Dr. Neeper, whether this is
8 addressed in your findings and conclusions that you
9 submitted after the hearings in May through August,
10 but it seems to me that what he is trying to do here
11 is address a subject where he is concerned that
12 there might be some confusion in the rule about the
13 setbacks for trenches. I don't see how that's
14 germane to the issues that we are dealing with here
15 today.

16 DR. NEEPER: May I respond?

17 CHAIRPERSON BAILEY: Yes.

18 DR. NEEPER: We heard testimony today of
19 Table 2 applying to burial and trenches, and the
20 result of this is that trench burial for wastes
21 within those limits do not have the conditions that
22 one might expect from the rule. Now, if that's
23 outside the limits let's just go ahead.

24 CHAIRPERSON BAILEY: Let's go forward
25 because that does seem to be outside.

1 DR. NEEPER: Very well. I will withdraw
2 those.

3 MR. SMITH: Let me ask you, just to make
4 sure we are not making a mistake here, if I were to
5 convert what Dr. Neeper just said, if I understand
6 it, it is that this topic was already opened up in
7 direct testimony by the proponent's witness. If
8 that's true, I think that he could move forward with
9 this, but my question is do you believe that this
10 topic has been opened up by your testimony?

11 MR. FELDEWERT: Number one, I objected to
12 this early on so I was very conscious of staying
13 within the aspects of the hearing, the germane
14 aspects of the hearing today. Number two, our
15 witness did not address in any sense the setbacks
16 that exist within the rule for these types of
17 trenches. The only thing my witness did with
18 respect to the rule was identify for you as a
19 prelude where Table 1 is cited within the rule and
20 where Table 2 is cited within the rule. That's it.

21 MR. SMITH: Yes, but what was the purpose
22 of him identifying that? It wasn't just to gratis
23 identify it. There was a purpose behind it.

24 MR. FELDEWERT: The purpose was to
25 identify the fines of materials, as you recall,

1 being addressed by Table 1 and Table 2, Table 1
2 being soils below below-grade tanks and lined pits
3 and Table 2 being the contents of the pits and
4 below-grade tanks.

5 MR. SMITH: Dr. Neeper, do you perceive
6 that the testimony you were wanting to give here
7 addresses the issue just described by the lawyer
8 over here?

9 DR. NEEPER: I'm not sure of the meaning
10 of -- the entire meaning of the objection. He has
11 said that his witness did not describe setbacks.
12 His witness described or cited where does this table
13 apply, and I am simply trying to say be aware of
14 where this table applies and where it doesn't apply.
15 That's beyond my legal training, although I have
16 served as a summary court-martial in the military.
17 I don't mean -- the court-martial was not on me. I
18 was the Court.

19 MR. FELDEWERT: Mr. Smith, I think you
20 will recall that the reason we went to the rule was
21 to identify the media that was involved until Table
22 1, soils in pits and below-grade tanks; and then the
23 media, the mixed-phase waste, I guess, that was
24 involved with Table 2 as being the contents of pits
25 and below-grade tanks. We didn't get into the

1 location, the siting issues, nothing.

2 MR. SMITH: I think that's a good
3 objection.

4 DR. BALCH: When we are in deliberation,
5 we will hopefully be very thorough in ferreting out
6 all the little mistakes and errors and there are
7 methods to fix the ones we don't catch.

8 MR. FELDEWERT: I might also add for the
9 record, we did look at this issue that's raised by
10 Dr. Neeper and I think you will find that in all due
11 respect, I think he is wrong. But that's for --
12 it's not for the issue here today, not to be debated
13 here today.

14 CHAIRPERSON BAILEY: The objection is
15 sustained. If we could just go forward with your
16 testimony.

17 DR. NEEPER: I believe this same objection
18 applies here. I heard even Mr. Feldewert use this
19 term today because it lit me up when he said this
20 table will apply if the wastes exceed that limit,
21 and yet there's a conflict in the rule which says
22 you can't have burial if the wastes exceed that
23 limit. So there is a conflict in the rule. I hope
24 you locate it.

25 MR. SMITH: Let me ask this. If that is

1 true, the statement that you made, Mr. Feldewert, do
2 you not think that he can testify in response to
3 that?

4 MR. FELDEWERT: I'm sorry, I missed the
5 statement.

6 MR. SMITH: Would you repeat what you just
7 said in terms of what you believe Mr. Feldewert
8 said, Dr. Neeper?

9 DR. NEEPER: Yes. What I believe I heard
10 Mr. Feldewert say in questioning his witness as he
11 was looking, I believe, at the rule, he said the
12 waste then can be buried if they exceed the limits
13 specified. In other words, it was the same wording
14 that I saw in the rule. And that caught my
15 attention because I felt this was an unintentional
16 error in the rule but it had profound impact.

17 MR. FELDEWERT: I don't recall saying
18 that. I think it's where Table 1 was used and Table
19 2 was used and the statement was if it meets the
20 Table 1 it can remain and if it doesn't, action has
21 to be taken. It certainly never went to the
22 provisions that Dr. Neeper is concerned about in the
23 slides.

24 CHAIRPERSON BAILEY: The objection is
25 sustained.

1 DR. NEEPER: I submit for the record of
2 the hearing, New Mexico Citizens for Clean Air and
3 Water Exhibit 6, Pages 1 through 9.

4 CHAIRPERSON BAILEY: Any objection?

5 MR. FELDEWERT: I think we have already
6 lodged our objections to the exhibit.

7 MS. FOSTER: No objection on admittance
8 from IPANM.

9 MS. GERHOLT: No objection.

10 MR. JANTZ: No objection.

11 MR. SMITH: This included the portions of
12 the exhibit to which you did object?

13 MR. FELDEWERT: I just looked. Yes.

14 CHAIRPERSON BAILEY: Then Exhibit 6 pages
15 1 through 9 are admitted into the record.

16 (Note: NMCCA&W Exhibit 6, Pages 1 through
17 9 admitted.)

18 CHAIRPERSON BAILEY: Does that conclude
19 your presentation?

20 DR. NEEPER: That concludes my
21 presentation.

22 CHAIRPERSON BAILEY: You are ready for
23 cross-examination?

24 DR. NEEPER: I am prepared for questions.

25 CHAIRPERSON BAILEY: Mr. Feldewert?

1 CROSS-EXAMINATION

2 BY MR. FELDEWERT

3 Q. Dr. Neeper, I'm looking at Page 4, and I
4 understand that you already addressed the fact that
5 all you are doing here is an approximation.

6 A. That's correct.

7 Q. And I'm assuming then that it contains
8 certain assumptions.

9 A. I offer this as an approximation because
10 we have heard it repeated that there is no exact
11 conversion. I'm acknowledging there is no exact
12 conversion but you may need to know what you are
13 talking about, and I presented the reasoning behind
14 it, the assumptions behind it are that the Institute
15 for Petroleum, IPEC, did not err tremendously in
16 their data, and that the U.S. Department of
17 Agriculture did not err tremendously in their data
18 so I can compare the two datasets. That is an
19 assumption.

20 Q. And this is where you are doing an
21 approximation to convert EC to milligrams per
22 kilogram, correct?

23 A. I will show the graph, a straight line
24 which is the red would be the 169. Someone else may
25 draw a line slightly off from that if they wish.

1 You can see from the scatter of the points what you
2 might think of as the error in the method, but at
3 least it lets you understand about where a
4 particular EC winds up in terms of a particular
5 milligrams per kilogram or part per million.

6 Q. Would you agree there could be different
7 interpretations with respect to the graph that you
8 put up there as Page 5?

9 A. I could not agree to that necessarily.
10 Somebody would have to give their interpretation
11 before I could see if I agreed with it.

12 Q. On Page 7 you have some limits here
13 expressed as a percentage of sodium chloride,
14 correct?

15 A. That's expressing the milligrams per
16 kilogram of chloride as how it would appear if you
17 said sodium chloride.

18 Q. Sodium chloride, right?

19 A. Yes.

20 Q. Are there some assumptions that go into
21 this conversion?

22 A. Yes. The assumptions are the atomic
23 weights of sodium and chloride and chlorine as given
24 in the Chemical Rubber Handbook of Chemistry and
25 Physics.

1 Q. Any other assumptions?

2 A. No.

3 Q. Did you account -- I'm not a soil
4 physicist or anything, but my understanding is
5 there's a lot of different chlorides. You were
6 focusing on sodium chloride. Did you account at all
7 for non-sodium components such as potassium
8 chloride?

9 A. I said this is how it would appear if you
10 interpreted the limit all as what we commonly call
11 salt or sodium chloride. Often other chlorides are
12 referred to as salt, salt being the result of an
13 acid base reaction.

14 Q. But your assumption is, and this is based
15 on the assumption that it was all sodium chloride?

16 A. I didn't have to assume that. I said if
17 you did consider it to be all sodium chloride, this
18 is what you would see. In my other direct testimony
19 elsewhere at times I have shown indeed it is not
20 necessarily all sodium chloride. Sometimes there
21 are other ions in the waste.

22 Q. Now, this whole concept of converting to
23 EC from milligrams per kilogram, I guess I'm
24 wondering why. Because as I understand it, and
25 correct me if I'm wrong, this idea of EC is not used

1 by any national or state regulatory standards for
2 waste, is it? I mean, you don't go out and find a
3 standard of EC.

4 A. You will find it as a standard recommended
5 by the American Petroleum Institute expressed in EC.
6 Your own witness expressed all of his results in EC.

7 Q. Now, I'm focusing here on waste, not
8 soils, not topsoils, for example. I'm focusing on
9 waste. There's no state or national regulatory
10 standards where they look at waste in terms of
11 what's its electrical conductivity.

12 A. I don't know, because I don't deal with
13 national regulatory standards. For petroleum wastes
14 there aren't any.

15 Q. If I'm understanding here today, you don't
16 have any -- the approximation that you show on Page
17 4, for example, you don't cite any supporting
18 literature for that, do you?

19 A. Supporting literature is on Page 5, and if
20 you want it --

21 Q. That's the only --

22 A. -- it will take me 20 minutes but I will
23 take you to it right down to the last number.

24 Q. And that's the only support that you cite
25 then for your approximation, right?

1 A. That is where it came from.

2 Q. Now, if I'm looking at Slide A, for
3 example, I think here is where we start combining a
4 lot of concepts, if I'm understanding. Your Slide 8
5 is where you take your approximations -- let me ask
6 you this: Is Slide 8 based solely on your
7 hypothesis that you can multiply milligrams per
8 liter by 20 to get milligrams per kilogram?

9 A. It is.

10 Q. And you don't have any supporting
11 literature for that conversion, do you? That
12 multiplication by 20? I don't see any cite.

13 A. I don't. Your previous witness does. He
14 addressed this.

15 Q. You're right.

16 A. Roughly the same number that's in the EPA
17 15.12. I could go get it out of there.

18 Q. You're right. There was some discussion
19 on that. But outside of the criticisms that
20 Dr. Robinson had about it this morning, any response
21 to that? I mean, you don't have any literature
22 supporting your conversion of 20 to one?

23 A. There couldn't be any supporting
24 literature. That comes out of the definition of the
25 EPA test and you apply what limits could occur

1 within that procedure.

2 Q. Okay. Have you ever asked a lab to take
3 the results in milligrams per liter using the EPA
4 method cited and convert them to milligrams per
5 kilogram?

6 A. No. Every lab test I ever got and every
7 lab test the OCD has got including tests of pit
8 contents came back in milligrams per kilogram, and
9 if the hearing went on another day I would take
10 opportunity to do some rebuttal on that topic.

11 Q. Well, at least you will agree with me then
12 that the EPA Testing Method 1312, as identified in
13 the current Pit Rule and any proposals by NMOGA,
14 yields a result in milligrams per liter, correct?

15 A. In the laboratory.

16 Q. That's how labs report it?

17 A. You come out. Let me expand on that. In
18 the laboratory your method in Table 1 also comes
19 out, and by your own witness today, every
20 measurement method he could think of required
21 dilution of the chloride from the solid with a
22 liquid, usually water in this case. So every
23 measurement you ultimately make is going to be on
24 the chloride in the liquid. Now, how you relate
25 that back to what your original solid sample was is

1 going to be up to you.

2 Q. But the laboratory has a method for
3 dealing with that, correct? They have a standard
4 method that's recognized for doing the conversion
5 based upon the material that is being analyzed?

6 A. I can't speak for the laboratory. I can
7 call one up and ask and they said, "We do this as a
8 matter of course." 300.0 delivers answer in
9 milligrams per liter. Ultimately that's what it is.
10 It has to be related back. The difference is
11 whether or not you dry the waste to get a mass
12 measurement of the solid object.

13 Q. I want to ask you something on Page 4.
14 You said you cited to the transcript for your
15 example down in the middle, EC limit of alkali
16 sacaton equals 12. Do you see that?

17 A. Yes.

18 Q. You cite to Page 2314 of the transcript.

19 A. That's the citation on Line 16.

20 Q. And that's Dr. Buchanan's testimony,
21 correct?

22 A. Yes. That's where -- notice the asterisk.
23 That's where the EC limit came from. I'm not
24 arguing EC limits.

25 Q. But you cite it, and you recognize, do you

1 not, that Dr. Buchanan, when you look at that
2 transcript, testified and the studies show that the
3 EC limits for native grasses to be twice as high, up
4 to 24, correct?

5 A. I wasn't citing native grasses, I simply
6 plucked one and put in a number.

7 Q. But where you plucked it from, the
8 testimony is that the EC limit for native grasses is
9 twice as high, correct?

10 A. I'm not testifying on the EC limit for
11 native grasses, and you're wrong, but that is a
12 topic for a different hearing. If you are going to
13 open up the hearing for EC on native grasses, I will
14 be glad to have the discussion with you.

15 Q. I was just curious what you cited there.

16 A. I needed an example because it's possible
17 the Commission could say, where have we used EC?
18 Where has EC entered the hearing and how would I use
19 this? So I said okay, for example, but I'd better
20 use some example that's already in the record of the
21 hearing. Otherwise, I'm introducing new testimony.

22 Q. I understand. Where this was being used,
23 correct -- and correct me if I'm wrong -- was that
24 they were examining the ability of plants to
25 germinate, correct?

1 A. I can't state whether he was using the 50
2 percent foliage damage or whether he was using seed
3 germination at that point. I have been through
4 other literature and I can find a range of values,
5 depending on how you wanted to define damage.

6 Q. But you will agree with me where you
7 plucked this from is where the witness was examining
8 the four foot of cover that is required by the
9 closure?

10 A. It has nothing to do with four foot of
11 cover.

12 Q. That's where it was being examined,
13 correct?

14 A. Whatever was going on at that time is what
15 was going on at that time, but he gave an EC limit.
16 It was a statement in the hearing. I could have
17 taken something off that other graph.

18 CHAIRPERSON BAILEY: Mr. Feldewert, I
19 think you have strayed outside the scope.

20 MR. FELDEWERT: Okay. I saw that cite and
21 I was trying to --

22 CHAIRPERSON BAILEY: Do you have any other
23 questions?

24 MR. FELDEWERT: I do not.

25 CHAIRPERSON BAILEY: Why don't we break

1 for the day, continue the case until tomorrow for
 2 further questions and rebuttal. We will continue
 3 this case at 9:00 o'clock tomorrow morning,
 4 Thursday, January 10th.. Is there public comment?
 5 Okay, thank you.

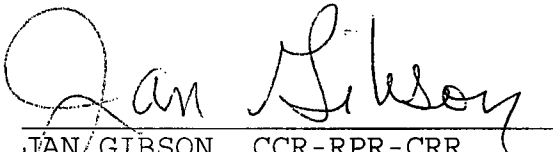
6 (Note: The hearing was adjourned at
 7 4:45) .

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REPORTER'S CERTIFICATE

I, JAN GIBSON, Certified Court Reporter for the State of New Mexico, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this case.


JAN GIBSON, CCR-RPR-CRR
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